Tailoring Psychotherapy to the Interpersonal Facets of Depression: A Relational Perspective on Depression Treatment and its Involved Micro-Processes

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David Eduard Silvester Altenstein
of Germany

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and PD Dr. phil. Christoph Flückiger

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Summary

Depression is a widespread and burdensome psychological disorder. Although a variety of equally effective psychotherapeutic treatments for depression exist, their success rates are insufficient, and relapse after treatment is common. Thus, there is a strong need to improve the scientific understanding of depression and its treatment. An aspect that is not yet fully understood is the interpersonal perspective on the disorder. Building on previous findings, the current dissertation project uses the Interpersonal Circumplex model as a framework to clarify (1) the interpersonal characterization of patients with depression, (2) how interpersonal changes during psychotherapy are associated with treatment success, and (3) what interpersonal characteristics and in-session micro-processes contribute to a productive psychotherapy process. To these ends, three empirical studies were conducted:

Study 1 was conducted in a naturalistic treatment setting and pursued the following goals: to refine the interpersonal characterization of outpatients with depression by using the Impact Message Inventory (IMI) to assess covert reactions (thoughts, feelings, and action tendencies referring to the patient) as perceived by the patients' significant others, and to investigate the change in impact messages during psychotherapy and its association with treatment outcome. The data demonstrated that, on average, patients with depression are best characterized by their submissiveness, but cluster analysis revealed a differentiation into four distinct sub-groups. Over therapy, patients decreased in their friendly-submissive, submissive, hostile submissive, and hostile impact messages and became more dominant and friendly-dominant. The reduction of submissive and hostile-submissive impact messages was related to positive outcome, whereas the change in friendly-submissiveness was not.

Study 2 was carried out in the context of a randomized controlled trial of two forms of Cognitive-Behavioural Therapy for depression and expanded the first study's view by relating the patients' own perception of their interpersonal problems using the Inventory of Interpersonal Problems (IIP) to impact messages, and by concurrently testing the predictive power of these perspectives in relation to therapy process and outcome. The results revealed that IIP affiliation was the best predictor of the therapeutic alliance and of cognitive-emotional processing. While a pre-post decrease in IIP distress was related to simultaneous outcome, the best predictor of symptomatic change subsequent to therapy was an increase in IMI dominance.

Study 3 sought to investigate how interpersonal in-session micro-processes that unfold between patient and therapist predict post-session evaluations of the therapeutic process, and how complementarity, an indicator of interpersonal harmony, develops over the course of a session. As predicted, more emotional arousal was associated with deviations from complementarity, whereas a positive alliance was related to friendly patient behavior. Multilevel growth modeling revealed a significant cubic trend of complementarity over the course of a session.

The closing section of the dissertation integrates the results theoretically and discusses them with regard to their clinical implications and their contribution to the field of psychotherapy research. Based on a recapitulation of the project's limitations, suggestions for future research are made. In sum, the three studies provide evidence that integrating distinct perspectives on patient interpersonal style and adhering to particular interpersonal therapeutic strategies may help improve the process and outcome of psychotherapy for depression.

Zusammenfassung

Depression ist eine weit verbreitete und belastende psychische Störung. Obwohl eine Vielzahl gleichermaßen wirksamer Psychotherapien zur Behandlung von Depression existieren, sind die Erfolgsraten unzureichend und Rückfälle nach der Behandlung häufig. Somit besteht die Notwendigkeit, das wissenschaftliche Verständnis der Depression und ihrer Behandlung zu maximieren. Besonders vielversprechend erscheint diesbezüglich die Erforschung der zwischenmenschlichen Facetten der Erkrankung. Das vorliegende Dissertationsprojekt stützt sich auf das Interpersonale Zirkumplex-Modell und verfolgt die Ziele, (1) die zwischenmenschliche Charakterisierung von Patienten mit Depression zu differenzieren, (2) zu analysieren wie interpersonale Veränderungen während der Psychotherapie mit Behandlungserfolg zusammenhängen, und (3) zu untersuchen welche zwischenmenschlichen Eigenschaften und Mikroprozesse in Therapiesitzungen zu einem produktiven Therapieprozess beitragen. Zu diesen Zwecken wurden drei empirische Studien durchgeführt:

Studie 1 verfolgte einerseits das Ziel, die zwischenmenschliche Charakterisierung von depressiven Patienten anhand der verdeckten Reaktionen (Gedanken, Gefühlen und Handlungstendenzen) ihrer Bezugspersonen mit Hilfe des Impact Message Inventory (IMI) zu verfeinern, andererseits wurde untersucht wie die Veränderung des interpersonalen Stils während der Therapie mit dem Therapieerfolg zusammenhängt. Die Daten bestätigten, dass depressive Patienten durchschnittlich als unterwürfig beschrieben werden können, jedoch ergab eine Cluster-Analyse eine Differenzierung in vier verschiedene Untergruppen. Während der Therapie wurden die Patienten dominanter und freundlicher. Die Reduktion der Unterwürfigkeit hing mit dem Behandlungserfolg zusammen.

Studie 2 wurde im Rahmen einer randomisierten, kontrollierten Studie zur Beforschung zweier Formen Kognitiver Verhaltenstherapie bei Depression durchgeführt und ging über die erste Studie hinaus, indem sie die durch das Inventar Interpersonaler Probleme (IIP) erhobenen und von Patienten selbst berichteten zwischenmenschlichen Probleme mit Impact Messages in Zusammenhang setzte und die differenzielle Vorhersagekraft dieser Perspektiven hinsichtlich des Therapieprozesses und -ergebnisses testete. Die Ergebnisse zeigten, dass IIP Affiliation der beste Prädiktor für die therapeutische Beziehung und der kognitiv-emotionalen Verarbeitung war. Während die Prä-Post-Abnahme des generellen Belastungsfaktors des IIP in engem Zusammenhang mit gleichzeitiger Symptomreduktion stand, war der beste Prädiktor für Symptomreduktion nach der Therapie ein Anstieg der fremdberichteten Dominanz im IMI.

Studie 3 verfolge das Ziel, zu erforschen wie die Patient-Therapeut-Interaktion während therapeutischer Sitzungen mit der Prozessevaluation nach denselben Sitzungen zusammenhängt. Zudem wurde untersucht, wie sich interpersonale Komplementarität, ein Indikator für Interaktionsharmonie, während einer Therapiesitzung entwickelt. Eine Abweichung von Komplementarität war ein Prädiktor für emotionale Aktivierung, während freundliches Patientenverhalten eine gute Therapiebeziehung vorhersagte. Der Verlauf der Komplementarität während einer Sitzung erwies sich als kubisch.

In ihrer Gesamtheit legen die drei Studien nahe, dass die Integration unterschiedlicher Perspektiven bezüglich des zwischenmenschlichen Stils depressiver Patienten sowie das Verfolgen bestimmter interpersonaler therapeutischer Strategien dazu beitragen kann, den Prozess und das Ergebnis von Depressionstherapien zu verbessern.

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1. Introduction

The following introduction provides the theoretical background for the three empirical studies included in this dissertation. The first part of the introduction defines depression as a psychiatric disorder and points out its significance by reviewing epidemiological data. The second part, after critically reconsidering existing data on the efficacy of depression treatment, argues for the necessity of enhancing treatments of this debilitating mental disorder. In the third part of the introduction the interpersonal perspective on depression is introduced as a means to deepen our understanding and improving psychotherapeutic treatment of depression. In this last part of the introduction the general aims of the three studies are explained without foreclosing the exact hypotheses and their specific theoretical backgrounds that are clarified in the individual studies.

Following the introduction, the centerpiece of this thesis will present three empirical studies as published or submitted for publication in peer-reviewed scientific journals. The aim of the first article is to investigate how depressed individuals change interpersonally over therapy from the perspective of their significant others and how this change is related to treatment outcome. The second study investigates whose perspective on the depressed persons' interpersonal characteristics and change is most informative: that of the depressed patient himself, or that of the patient's significant other. The aim of the third study is to analyze the specific in-session unfolding of the actual interaction between patient and therapist in relation to psychotherapeutic change processes.

The last part of the thesis comprises a critical discussion of the demonstrated empirical findings in the light of the general theoretical background as reviewed in the

introduction. The implications of the findings of the three studies will be discussed and suggestions for possible future research will be made.

1.1 Major Depressive Disorder and its Consequences

Clinical depression is considered a mental disorder, characterized by a set of the following emotional, cognitive, behavioral, and somatic symptoms, as described by the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000; DSM-5; American Psychiatric Association, 2013) and the International Statistical Classification of Diseases (ICD-10; World Health Organization, 1992): (1) depressed mood, (2) decreased interest in most activities (or anhedonia), (3) significant weight change (5 % of body weight) or change in appetite, (4) change in sleep (insomnia or hypersomnia), (5) change in activity (psychomotor agitation or retardation), (6) fatigue or loss of energy, (7) feelings of guilt and/or worthlessness, (8) diminished ability to concentrate and/or indecisiveness, and (9) suicidality. In the context of a dichotomous model of disease as adopted by the DSM and the ICD, five of these symptoms must be present in an individual over a period of at least two consecutive weeks for the diagnosis of a major depressive disorder (MDD). As an additional criterion, the DSM suggests the manifestation of at least one of the above-mentioned main criteria (1) or (2) as a necessary condition, whereas the ICD suggests (1), (2), and (6) as main criteria, two of which should be met to determine diagnosis of major depressive episode (MDE).

While an abundance of epidemiological data on depression gathered over the past decades is suggestive of the significance of this psychiatric disorder (for review, see Kessler & Wang, 2009), two recent large-scale epidemiological studies with representative community samples report the twelve-month prevalence and the

lifetime prevalence in the US with 6.6 % and 16.2 % (Kessler et al., 2003), and worldwide with 5.5 % and 14.6 % in high-income countries and with 5.9 % and 11.9 % in low- to middle income countries respectively (Bromet et al., 2011). The projected lifetime risk of developing at least one major depressive episode is 23.2 % and women are 1.6 times more likely to develop depression than men (Kessler et al., 2005). That being said, major depressive disorder is the most prevalent single DSM diagnosis. For those subjects suffering from depression, the chances are 19 % that the illness takes a chronic course (Mueller et al., 1996) and 80 % that the depression recurs (Kessler et al., 2003).

The consequences of depression are numerous and significant both for the afflicted individuals and for society at large (for review, see Kessler, 2012): On the individual level, the development of depression is related to role impairment/disability (Merikangas et al., 2007) increased suicide risk by the factor 5 (Harris & Barraclough, 1997), decreased quality of life (Üstün, Ayuso-Mateos, Chatterji, Mathers, & Murray, 2004), and increased risk of somatic disease (Mathers, Fat, & Boerma, 2008). Importantly, there is abundant evidence that depression impedes role transitions in life: A history of depression predicts high school dropout, failure to enter college, college dropout (Kessler, Foster, Saunders, & Stang, 1995), teenage pregnancy (Kessler et al., 1997), poor marital quality and divorce (Kessler, Walters, & Forthofer, 1998), and unsuccessful transition from welfare to work (Danziger, Carlson, & Henly, 2001). Adopting a more general point of view, the costs of loss of productivity in the United States due to depression are estimated at 36 billion dollars (Kessler et al., 2006). As a conclusion, the reviewed research confirms the high worldwide importance of depression and underlines that MDD occurs commonly and impairs seriously.

Faced with the question how to ameliorate the situation of depressed individuals or of those at risk for developing depression, three strategies seem promising: foster and improve prevention programs for depression, facilitate access to effective treatments, or enhance already effective treatments for depression. The latter is the approach chosen by this thesis. In the following section, the literature on psychotherapy efficacy for depression is reviewed and the interpersonal perspective on depression psychopathology and treatment is introduced as one way to deepen understanding of and to improve depression treatment.

1.2 Efficacy of Psychotherapy for Depression

Thanks to numerous outcome studies in the past decades, the results of which were aggregated in several meta-analyses, it is by now beyond dispute that psychotherapy for depression is effective in adult outpatients (Cuijpers, van Straten, Andersson, & van Oppen, 2008) as well as inpatients (Cuijpers, Clignet, et al., 2011). Moreover, it is just as effective as pharmacotherapy (Robinson, Berman, & Neimeyer, 1990), and that the combination of psychotherapy and pharmacotherapy is more successful in alleviating depression than either one of the treatments alone (Cuijpers, van Straten, Warmerdam, & Andersson, 2009). Beyond statistical significance, when active psychotherapies were compared to non-active control conditions, the average effect size was $d = 0.66$ (Cuijpers, Andersson, Donker, & van Straten, 2011) and benchmarks for pre-post improvement on continuous depression measures were found to range from $d = 1.9$ to 2.2 (Minami, Wampold, Serlin, Kircher, & Brown, 2007). However, there is evidence that these effect sizes were overestimated due to publication bias, that is, the increased probability for significant results to be accepted for publication (Cuijpers, Smit, Bohlmeijer, Hollon, & Andersson, 2010). With respect

to dichotomous outcome measures, the results are still promising but less flattering for psychotherapy: Even in methodologically rigorous randomized controlled trials with manualized treatments, only 62 % of patients no longer met criteria for MDD after psychotherapy and roughly only half of the patients met criteria for response and remission (Cuijpers et al., 2014). Still, a systematic review by Hollon and Ponniah (2010) lists 125 psychotherapeutic treatments and, based on the criteria for evidence-based interventions of Chambless and Hollon (1998), concludes that cognitive-behavior therapy (CBT), interpersonal therapy (IPT), and behavior therapy (BT) are efficacious and specific and that emotion-focused therapy (EFT) and brief dynamic therapy (BDT) are possibly efficacious. Analyzing the relative efficacy of different psychotherapeutic approaches for depression, the meta-analysis by Cuijpers et al. (2008) grouped the effective treatments into the seven groups – cognitive–behavioral therapy, nondirective supportive therapy, behavioral activation therapy (BA; equivalent to the above-mentioned BT), psychodynamic therapy (equivalent to BDT), problem-solving therapy (PST), Interpersonal psychotherapy, and social skills training (SST) – finding no difference in efficacy between the treatments except for a significant but small advantage for IPT and a slim disadvantage for nondirective supportive therapy. Increasing the statistical power to detect differences by including indirect comparisons between treatments, a recent network meta-analysis confirmed the slight statistical superiority of IPT, at least over nondirective supportive therapy (Barth et al., 2013). However, such feeble differences are highly questionable, as relative outcome effects were found to be generally overestimated due to the researcher allegiance bias, that is, the phenomenon that the researcher's belief in the superiority of one treatment influences the study outcome in favor of the preferred approach (Munder, Brutsch, Leonhart, Gerger, & Barth, 2013; Munder, Gerger,

Trelle, & Barth, 2011). Thus, it can be concluded that all of the seven above-mentioned psychotherapeutic approaches for depression have comparable benefits in line with the long-standing hypothesis of the *dodo bird verdict* in psychotherapy research (Luborsky, Singer, & Luborsky, 1975).

Despite these promising findings, the following aspects cause concern and discourage from premature euphoria: First, access to adequate healthcare resources for depressed individuals was found to be disturbingly difficult. Even in the US, where the movement of evidence-based interventions originated, only about half of depressed patients received any treatment for depression at all and as few as 20 % received an adequate treatment that conformed with published treatment guidelines (Kessler et al., 2003). Second, as mentioned above, even if patients were treated with the most adequate therapeutic approaches, only about two thirds of patients no longer met criteria for MDD after treatment (Cuijpers et al., 2014). Third, a meta-analysis on the risk of MDD recurrence after therapy found that even successfully treated patients relapse with a probability of 29 % one year after treatment ended, and with 54 % two years after treatment (Vittengl, Clark, Dunn, & Jarrett, 2007). The urgent necessity to improve current psychotherapies is therefore evident, and was emphasized by a work group of the National Institute of Mental Health (NIMH) that issued a call for the development of effective interventions that address both symptom change and functional capacity, and that prevent onset and recurrence of MDD (Hollon et al., 2002). Nevertheless, it remains to be determined which strategy for enhancement is most fruitful.

One data-driven strategy to improve psychotherapy for depression was employed by the Task Force on Empirically Based Principles of Therapeutic Change that was initiated by the American Psychological Association and derived principles

of change from the available outcome literature for a number of psychopathologies (Castonguay & Beutler, 2006). Besides recommending a number of common transdiagnostic treatment principles, the authors formulate the following six evidence-based technique principles that maximally effective psychotherapies for depression should attend to (Follette & Greenberg, 2006): (1) restructuring of cognitive schemas, (2) increase of positive reinforcement and decrease of behavioral avoidance, (3) improvement of interpersonal functioning, (4) improvement of dysfunctional social surroundings and relationships, (5) increase of awareness, acceptance, and regulation of emotional experiences, and (6) structuring treatment and developing a focus for therapy. Although informative, these recommendations remain vague as to what specific therapeutic strategies to attend to in order to tackle particular problems associated with depression. In consequence, a second, more theory-driven strategy to improve depression therapy might be explanatory and complementary: Several authors emphasized the importance of identifying vulnerability factors for depression and then altering these vulnerability factors in order to reduce the risk of depression recurrence beyond mere symptom improvement (Beevers, 2011; Hayes, Castonguay, & Goldfried, 1996; Ormel, Oldehinkel, & Vollebergh, 2004). In other words, investigating whether altering the vulnerability factor is a mechanism of change (Kazdin, 2007). Among the numerous vulnerability factors discussed in the literature (for review, see Gotlib & Hammen, 2008), the interpersonal functioning of the individual has gained scientific attention and empirical support in the past decades (Hames, Hagan, & Joiner, 2013; Hammen & Shih, 2014; Joiner & Timmons, 2008). Thus, whether, you adhere to the first, more data-driven, above-mentioned strategy to enhance psychotherapy for depression, or the second, more theory-driven strategy, it can be concluded that deepening the understanding of the interpersonal

aspects of depression is – among others – an approach that promises to reveal meaningful insights into depression psychopathology and treatment. Thus, the next section reviews the most important findings regarding the interpersonal perspective of depression and introduces the interpersonal circumplex as a nomological framework that can be used to integrate and graphically represent interpersonal theories of depression and derive the hypotheses tested in this thesis.

1.3 An Interpersonal Perspective on Depression and its Treatment

As seen above, depression is associated, with various emotional, cognitive, behavioral, and somatic symptoms. Although not explicitly stated in the DSM, it is not far-fetched to suppose that some of these symptoms are very likely to take a toll on the social life of a depressed individual, which, in turn, may help maintain the current depressive episode, and may increase the likelihood of future episodes. For instance, a person experiencing feelings of worthlessness and guilt on a symptomatic level is likely to perceive social situations in this dim light and will most probably behave accordingly, for example by excessively seeking for reassurance from others. This behavior, of course, does not go unperceived by the persons interacting with the depressed person, and is likely to affect their feelings, perceptions and behaviors. Therefore, the following sections will discuss the specific interpersonal factors that are associated with and predispose for depression. Then, these interpersonal variables will be integrated under the conceptual umbrella of the interpersonal circumplex model, and it will be delineated how psychotherapy for depression should be tailored to the interpersonal characteristics of this pathology in order to most effectively and most sustainably alleviate depression.

1.3.1 Interpersonal vulnerability factors for depression. Although philosophers from Plato to Rousseau emphasized the influence of interpersonal factors on the person's well-being, the beginnings of psychotherapeutic theory only touched upon the interpersonal view of depression tangentially, stating that depressed people's "complaints are really "plaints" in the legal sense of the word. … (E)verything derogatory that they say of themselves at the bottom relates to someone else. … (T)hey give a great deal of trouble, perpetually taking offence and behaving as if they had been treated with great injustice." (Freud, 1917/1951, p. 247). After that, psychoanalytic theory, with merit and smoothing the way for numerous fruitful developments in psychotherapy research, has centered on the intrapsychic conflicts rather that the interpersonal processes involved in depression. It was not until James Coyne, in his landmark article "Toward an interactional description of depression" (Coyne, 1976), took up this line of thought again and inspired numerous psychotherapy researchers to systematically investigate the interpersonal nature of depression. Coyne hypothesized that the depressed individual is part of and creates a deteriorating and emergent system of depressive symptomatology and responses from others: At first, the depressive person, through the display of depressive symptoms, elicits concern and the urge to support in others. At the same time, the depressive symptoms arouse guilt in others and inhibit the expression of hostility in others. Therefore, significant others try to reduce the aversive behavior through (inauthentic) support and reassurance, but simultaneously send subtle messages of hostility and avoidance. The depressed patients, confirming their negative view of self, adequately but selectively perceive this rejection and, as a consequence, seek further reassurance and convey more distress, thus contributing to the perpetuation of the depressive interpersonal vicious circle. This hypothesis inspired an abundance

of studies investigating the bidirectional causal relation between interpersonal factors and depression. The interpersonal factors that predict, correlate with, and are consequences of depression highly overlap. For the purpose of this dissertation project, the current state of research relating to interpersonal vulnerability factors for depression will be reviewed, as their understanding particularly informs the enhancement of psychotherapy for depression. Two types of studies provide the most convincing empirical support for a variable as a vulnerability factor for depression: In the first, a variable is measured at one point in time and is used to predict depression onset or symptomatology. In the second, also a longitudinal design, the potential vulnerability factor is investigated in the context of a diathesis-stress model with respect to its capacity to produce (interpersonal) stress for the depressed individual itself, which, in turn, causes depression. These models are referred to as stress generation models (Hammen, 1991, 2006).

Interpersonal vulnerabilities for depression can be categorized into interpersonal behaviors and interpersonal styles or traits although the constructs are most probably organized along a continuum rather than in two dichotomous classes. At the trait-like end of the continuum ranges the phenomenon of interpersonal inhibition (withdrawal, reticence), the manifestation of which in childhood was shown to predict the onset of MDD (Caspi, Moffitt, Newman, & Silva, 1996) and depressive symptomatology (Katz, Conway, Hammen, Brennan, & Najman, 2011) in early adulthood. Sharing conceptual overlap with inhibition, the interpersonal style of shyness, defined as discomfort with social novelty, also predicted depressive symptomatology unless buffered by peer inclusion (Gazelle & Ladd, 2003) or by social support (Joiner, 1997). Similarly, fundamental personality traits were consistently found to be vulnerability factors for later MDD, in the way that high

neuroticism/negative emotionality and low extraversion/positive emotionality were precursors of depressive disorders in children and in adults (reviewed in D. N. Klein, Kotov, & Bufferd, 2011). Emerging from different psychological traditions, theorists have paid particular attention to two closely related interpersonal traits in recent years: sociotropy and dependency. Beck's (Beck, Epstein, & Harrison, 1983) notion of sociotropy refers to the excessive need for and doubt about interpersonal attachment, whereas dependency (Blatt, Quinlan, Chevron, McDonald, & Zuroff, 1982) is defined as the preoccupation with relatedness including strong wishes to be close to others and fear of abandonment. Both constructs have been studied in methodological rigorous designs and were found to predict onset of MDD (Mazure, Bruce, Maciejewski, & Jacobs, 2000; Sanathara, Gardner, Prescott, & Kendler, 2003), as well as depressive symptomatology (Mongrain, Lubbers, & Struthers, 2004; Shih, 2006). However, based on the contradictory findings from diathesis-stress models that high investment in relationships sometimes generates but sometimes reduces stress, Shahar (2008) suggests a more complex conceptualization of dependency, incorporating both adaptive relatedness and maladaptive neediness.

Building on Bowlby's (1973) attachment theory, a large number of studies consistently found that insecure attachment, particularly avoidant and anxious attachment, predicts depressive symptomatology (e.g., Duggal, Carlson, Sroufe, & Egeland, 2001; Eberhart & Hammen, 2006; Morley & Moran, 2011) as well as stress generation that, in turn, makes the individual vulnerable for depression (Eberhart & Hammen, 2010; Hankin, Kassel, & Abela, 2005). Similarly, high levels of rejection sensitivity, that is the tendency to anxiously expect, readily perceive, and strongly react to rejection, was found to increase the association between interpersonal stress

and depressive symptomatology (Chango, McElhaney, Allen, Schad, & Marston, 2012).

Picking up on Coyne's (Coyne, 1976) original interpersonal theory of depression, Joiner, Alfano, and Metalsky (1992) propose that depressed individuals elicit rejecting responses from others and thus contribute to the maintenance of their depression through excessive reassurance seeking, that is the seeking of reassurances from close significant others that they truly care for them and love them. A recent meta-analyses shows that excessive reassurance seeking is a stable correlate of depression (Starr & Davila, 2008), but there is also some evidence that it prospectively predicts depressive symptomatology (Davila, 2001) and stress generation (Shih & Auerbach, 2010).

Seemingly contradictory to the phenomenon of excessive reassurance seeking, self-verification theory (Swann, Wenzlaff, Krull, & Pelham, 1992) suggests that depressed individuals also engage in negative feedback seeking, that is the disposition to elicit criticism from others about the self as a result of the need to seek evidence that is consistent with one's negative self-concept. In the most rigorous test of this construct, negative feedback seeking was found to be prospectively related to depressive symptomatology only in girls (Borelli & Prinstein, 2006).

At the state-like end of the continuum of interpersonal vulnerability factors for depression the phenomenon of "corumination" can be located. Extending Nolen-Hoeksema's (1991) earlier research on ruminative response style in depression, corumination is defined as an interpersonal ruminative process within a dyad that is non-solution focused and in which the individuals focus on details of the problem and the associated negative feelings (Rose, 2002). Using a longitudinal design, corumination could be shown to prospectively predict first-onset major depressive

episodes, shorter time to episode, and longer, more severe episodes of depression in both females and males (Stone, Hankin, Gibb, & Abela, 2011).

To sum up, the current state of research portrays individuals that are inhibited, shy, neurotic, introverted, sociotropic, dependent, insecurely attached, sensitive to rejection, that excessively seek reassurance, seek negative feedback, and/or coruminate as particularly vulnerable for depression. Therefore, psychotherapy should try to directly change these vulnerability factors in order to most effectively and most sustainably alleviate depression.

A model that can serve as an umbrella theory integrating the above-mentioned interpersonal variables on a more general, abstract level and accounting for the inherently interactional nature of these variables is that of the interpersonal circumplex model (Horowitz & Strack, 2011). After giving a short outline of the basic assumptions of this theory, it will be explained how Coyne's aforementioned interpersonal perspective on depression can be understood in circumplex terms. First proposed by Leary (1957), the interpersonal circumplex (IPC) is defined by two orthogonal axes: a horizontal axis of affiliation (also: solidarity, friendliness, warmth, love, or communion) with its poles friendly and hostile, and a vertical axis of dominance (also: power, control, or agency) with its poles dominant and submissive (see Figure 1). Each point within the IPC can be defined by a combination of the values on these two variables (x- and y-axes) and the resulting localization in a two-dimensional space. This model can be used to assess trait-like interpersonal characteristics of individuals (or groups) or to evaluate behavioral acts with regard to their dominance and affiliation. Moreover, by being able to locate the behavior of several interactants at moments of interest during their interaction this model enables

to test hypotheses regarding mutual influences and trace the unfolding of the interaction, independent of the content being delivered.

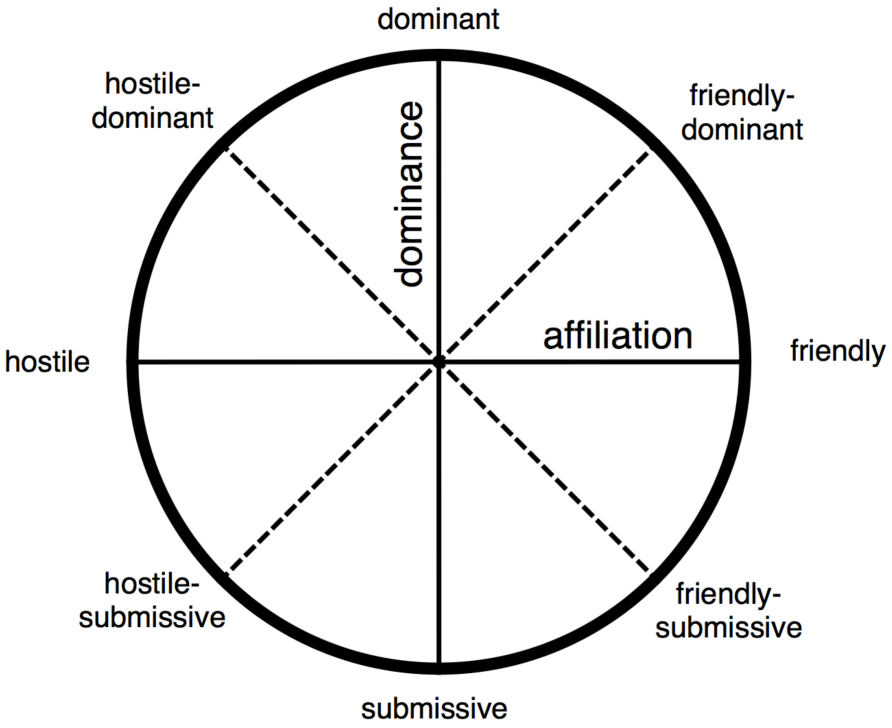

Figure 1. Octant version of the Interpersonal Circumplex Model.

A particular form of mutual interpersonal influence is the construct of interpersonal complementarity, which is one of the central assumptions of the IPC model. Generally perceived as an indicator of harmony or smoothness of an interaction, Carson (1969) proposed the first definition of interpersonal complementarity based on the IPC. According to Carson, complementarity is characterized by similar behaviors on the affiliation axis (correspondence), as well as oppositeness of the interactants' behaviors on the dominance axis (reciprocity). Accordingly, friendly behavior invites friendly behavior and hostile behavior pulls for hostile behavior, whereas dominant behavior is answered by submissive behavior and vice versa.

Donald Kiesler in his (1996) matchless work on contemporary interpersonal theory and research elucidates how the IPC model can be used to understand the inherently interactional nature of psychopathology and psychotherapy in general. More specifically, he explains Coyne's (1976) interactional model of depression in the light of the IPC. By doing so, he either reflects or anticipates many of the aforementioned relational vulnerability factors for depression: The onset of depression is characterized by inner experiences of low self-worth, sadness, hopelessness and self-effacing cognitions that leads the patient to behave towards others in moderately unassured, obedient, and deferent ways, hence in segments of the IPC most close to the submissive pole of the control axis. The application of the principle of complementarity reveals that the patient's significant other, in response to the interpersonal behavior of the depressed patient, is pulled toward modestly giving advice, leading and behaving in an assured way, thus exhibiting behaviors ranging from just left to just right of the dominant end of the control axis. In the earlier stage of the relationship, the friendlier components of the significant other's reactions will prevail and the interaction will be somewhat satisfying to both interactants. But as the relationship continues, the depressed person's behaviors do not change. As a consequence, the significant other experiences the rigid interactional pattern as strenuous and less satisfying and behaves in a slightly less friendly-dominant and more rejecting, hostile-dominant way. Due to the depressive's sensitivity to rejection, he/she readily perceives these subtle changes and the negative emotions and cognitions are intensified. This leads the depressive person to excessively seek reassurance and to act less friendly-submissive and move towards the inhibited that is hostile-submissive segments of the IPC. This escalates the maladaptive transactional pattern because the significant other is pulled to show mistrust and

even resentfulness towards the patient. As the depressed patient becomes increasingly vulnerable to rejection, he/she (correctly) perceives the efforts towards friendliness of the significant other as inauthentic and selectively attends to (seeks) the negative feedback he receives. The significant other grows progressively frustrated and both interactants are trapped in a rigid interpersonal pattern. This interactional impasse is characterized by the perpetuated exchange of hostile-submissive and hostile-dominant behaviors.

1.3.2 Tailoring psychotherapy to the interpersonal characteristics of depression. The aforementioned complementary and interdependent exchange of hostile-submissive behaviors on the part of the depressed individual and hostile-dominant behaviors on the part of the significant other is the theoretical basis for the first two empirical studies included in this thesis. If the assumption is correct, then the group of depressed patients should indeed be characterized by an average interpersonal style in the submissive hemisphere of the IPC. Furthermore, the disruption of the abovementioned hostile-submissive / hostile-dominant exchange should be possible by the depressed patient taking the initiative and becoming more dominant and more friendly again. These behaviors should pull for affirmative warmth from the significant other and should increase the probability that the depressed patient's needs will be met, hereby breaking out of the vicious circle, and thus eventually improving depressive symptomatology. The confirmation of this assumption would be in line with the aforementioned argument that effectiveness of psychotherapy for depression can be maximized by changing the specific (here: interpersonal) vulnerability factors for the disorder (Beevers, 2011; Hayes et al., 1996; Ormel et al., 2004). In addition, corroborating results would provide a strong empirical argument for the inclusion of the interpersonal perspective in any kind of

psychotherapeutic treatment for depression in order to enhance treatment efficacy and sustainability. This would point towards interpersonal change as a potential general change mechanism in depression therapy. The following section briefly reviews previous research regarding these central assumptions of the interpersonal theory of depression (for a more in-depth consideration of the literature, see the introductory sections of the respective studies in the mid-section of this thesis). Furthermore, it points out how the first two studies included in this dissertation project aim to extend previous findings, solve ambiguities, and bridge empirical gaps.

Two of the most popular and widely used circumplex measures in clinical psychology are the Inventory of Interpersonal Problems (Horowitz, Alden, Wiggins, & Pincus, 2000) and the Impact Message Inventory (Kiesler & Schmidt, 2006). The former is used as a self-report measure to assess interpersonal problems associated with each octant of the IPC. The latter assesses the covert reactions (feelings, thoughts, and action tendencies) that a target person evokes in another person. From the items of both questionnaires, eight scales that lie in circular order according to the IPC, and/or the two dimensions of dominance and affiliation can be calculated. Both questionnaires have been used in an attempt to investigate the interpersonal characteristics of depressive individuals. Overall, previous studies found that IIP self-report ratings (Barrett & Barber, 2007; Cain et al., 2012; Grosse Holtforth et al., 2014; Vittengl, Clark, & Jarrett, 2003) and IMI ratings by therapists (Constantino et al., 2008) generally converge in portraying the interpersonal style of patients with depression as submissive with less consistent results regarding the affiliation dimension, pointing towards a possible heterogeneity among depressed patients. Taken together, studies 1 and 2 have the aim to corroborate the earlier findings by interpersonally characterizing depressive individuals from the perspective of the

patients themselves as well as from the perspective of their significant others by using IIP and IMI ratings. Moreover, beyond investigating the general interpersonal style of depressed individuals, study 1 will investigate the possible interpersonal heterogeneity among depressed patients and aims at empirically differentiating interpersonal sub-groups of depressed patients.

An important unsolved methodological issue is that of possibly contradictory perspectives on patient interpersonal style: Whereas some studies found moderate agreement among self- and other-reported interpersonal problems (Foltz, Morse, & Barber, 1999; Ready & Clark, 2002; Saffrey, Bartholomew, Scharfe, Henderson, & Koopman, 2003), the scarce empirical findings linking self-reported IIP and other-reported IMI ratings are intriguing: The only study that directly tested associations between IIP and IMI (as evaluated by the therapists) characterizations of depressive psychotherapy patients (Quilty, Mainland, McBride, & Bagby, 2013) did not find any significant associations between the affiliative dimension of the IIP and the IMI but, surprisingly, a negative association on the dominance dimension of the two instruments. This stands in contrast to the moderate agreement between self- and other-reported IIP ratings. Hence, study 2 aims at gaining insight into the possible reasons for this ambiguity by reanalyzing the association between IIP and IMI ratings. But instead of asking the patients' therapists, study 2 relies on the patients' significant others as source of information.

The second central postulation of the aforementioned interpersonal theory of depression is that good psychotherapy should encourage depressive patients to behave in a friendlier and more dominant manner, and that this interpersonal change over therapy should be associated with symptomatic improvement. As for interpersonal problems, several studies have found that depressive patients' scores

on all octant scales decreased significantly over therapy, thus general severity of interpersonal problems improved (Horowitz, Rosenberg, & Bartholomew, 1993; Huber, Henrich, & Klug, 2007; Vittengl et al., 2003) but that neither the dominance dimension nor the affiliation dimension of the IIP changed significantly (Quilty et al., 2013; Renner et al., 2012; Vittengl et al., 2003). These unspecific findings are contrasted by one study investigating the change of chronically depressive patients' IMI ratings over therapy (Constantino et al., 2008): They were found to decrease most readily in submissive, hostile, and hostile-dominant octants, whereas they increased in the friendly-submissive and friendly-dominant scales. Dimensional scores, however, were not reported. Moreover, to date there was no study that analyzed whether IIP and IMI ratings of depressive patients change in similar of different ways over treatment. In consequence, whereas study 1 of this dissertation project focuses, as mentioned before, on the perspective of the significant others, study 2 broadens the view by taking both self-reported IIP and other-reported IMI change into account. Thus, study 2 aims at extending previous findings, on the one hand by using dimensional scores, and on the other hand by directly testing the associations between IIP and IMI interpersonal change from before to after cognitive-behavioral therapy.

As far as the relation between interpersonal change over therapy and symptomatic change is concerned, the evidence is extremely scarce: Only one previous study found that a decrease in therapist-perceived hostile-submissive impact messages was related to a decrease in depressive symptoms (Constantino et al., 2012), but no study tested the association between specific interpersonal changes over therapy and symptom improvement, whereas a few reported pre-treatment interpersonal patient characteristics to be related to outcome (Borkovec,

Newman, Pincus, & Lytle, 2002; Gurtman, 1996; Quilty et al., 2013; Ruiz et al., 2004). Thus, study 1 has the aim to replicate Constantino et al.'s (2012) earlier findings, whereas study 2 will extend this perspective by considering both the paients' and the significant others' perspective in such a way that change in IIP and in IMI ratings will be concurrently tested to predict outcome. The relationship of pre-post interpersonal change in relation to pre-post symptomatic improvement hints at a general change mechanism in psychotherapy. Nevertheless, the issue of depressive relapses after therapy calls for particular scientific attention, because, as pointed out in the section on treatment efficacy, the majority of effectively treated patients relapse after therapy has ended (Vittengl et al., 2007). Therefore, study 2 will not only predict pre-post symptomatic change but also be the first study in the field to present data on long-term symptomatic change after treatment by using pre-post IIP and IMI change to concurrently predict symptomatic change from post to follow-up, that is three months after therapy has ended.

In sum, studies 1 and 2 aim at contributing to the better understanding of, first, the interpersonal characterization of depressed individuals, second, the specific ways the interpersonal vulnerability factors for depression change over therapy, and third, the benefit of this interpersonal change in terms of short- and long-term symptomatic improvement, all the while considering patients' interpersonal characteristics from their own perspective as well as through the eyes of their significant others.

1.3.3 Interpersonal promotion of beneficial therapeutic processes. The previous passages of this introduction have argued for the enhancement of psychotherapy for depression by motivating depressive individuals to change their interpersonal behavior in such a way that they become more friendly-dominant again, maneuver themselves out of the interactional impasse with their significant others,

and thus contribute to the short- and long-term improvement of their depressive symptomatology. Complementing this perspective of therapeutic change, the next section will explain how the IPC can be used as a nomological framework to better understand how the known active ingredients of psychotherapy, namely the therapeutic alliance and cognitive-emotional processing, can be fostered.

Psychotherapy is an inherently interactional activity (Orlinsky, Ronnestad, & Willutzki, 2004), and the active ingredients of psychotherapy are closely intertwined with the interpersonal behaviors of therapists and patients. Consequently, it is crucial for the advancement of psychotherapy research to characterize those pre-treatment interpersonal patient characteristics and interactional patterns between patient and therapist in a differentiated way that promote or hinder change processes that, in turn, predict therapy success. As the abundance of process-outcome research during the past decades has shown (Crits-Christoph, Connolly Gibbons, & Mukherjee, 2013), two variables that are among the most strongly and most consistently related to treatment success are the therapeutic alliance (Horvath, Del Re, Flückiger, & Symonds, 2011), as well as cognitive-emotional processing (Pascual-Leone & Yeryomenko, 2012).

Originating in the psychoanalytic tradition the *therapeutic alliance* is one of the most widely and thoroughly investigated concepts in psychotherapy research. Although there is no universally accepted definition (Horvath, 2001), the therapeutic alliance (also: working alliance, helping alliance) has been explicated pantheoretically to include the following concepts: an affective bond between patient and therapist, the client's motivation and ability to accomplish work collaboratively, the therapist's empathic responding to and involvement with the client, as well as client and therapist agreement about the goals and tasks of therapy (Wampold, 2001). Largely

corroborating and extending the findings of earlier reviews (Horvath & Bedi, 2002; Horvath & Symonds, 1991; Martin, Garske, & Davis, 2000), a recent meta-analysis (Horvath et al., 2011) synthesized the results of 190 independent data sources found an overall aggregate alliance-outcome relation of $r = .275$ irrespective of therapeutic approach, assessment method, or rating perspective. This finding indicates that the alliance explains a fair proportion, if by far not all, of the differences in therapeutic outcomes.

Within recent years, an increasing number of empirical investigations have focused on the role of emotions in the therapeutic process. Corroborating the findings of two earlier reviews (Greenberg & Pascual-Leone, 2006; Whelton, 2004) a recent meta-analysis (Pascual-Leone & Yeryomenko, 2012) aggregating the data of 458 patients from 11 studies reports that peak levels in the *Experiencing Scale* correlate with outcome at r=.236. The *Experiencing Scale* (EXP; M. H. Klein, Mathieu-Coughlan, & Kiesler, 1986) measures two distinct but interrelated psychological processes: emotional engagement as well as making new meaning. Emotional engagement can be defined as a process involving emotional arousal, acceptance and both nonverbal and verbal expression of the aroused emotion. However, cathartic arousal alone does not suffice for therapeutic change to occur. It seems to be necessary that the patient also makes new meaning of the possibly painful emotional experience in the session. In this meaning-making process the patient is assumed to have *clarification experiences* (Grawe, 2007) through which he/she acquires a better understanding of him or herself as a person and/or of his or her problems. Given that this two-fold process involves emotional as well as cognitive elements, i.e., arousal and clarification, we refer to this process henceforth as *cognitive-emotional processing*.

The interpersonal variables that might foster the alliance and cognitive-emotional processing can be investigated at different levels of specificity: On the one hand, it can be explored how interpersonal patient attributes relate generally to therapeutic process over the entire therapy or phases of treatment. This knowledge would be useful for case conceptualization or allocation heuristics (for example referring patients with particularly problematic interpersonal traits to more experienced therapists). As explained below, this is one of the aims of study 2. On the other hand, to make theoretically sound and empirically-based recommendations on how therapists may promote process variables through their therapeutic actions, the field is in need of studies that analyze the interpersonal processes occurring within the sessions at a more fine-grained level and relate these processes to post-session reports. This is the aim of study 3.

Considering patients' interpersonal pre-treatment characteristics through the theoretical lens of the IPC in relation to process variables, several theorists argue that the development of a positive and stable therapeutic alliance should be particularly difficult to establish with patients who are critical, cold, and/or withdrawn, given the natural tendency of hostile patient behavior to elicit complementary counter-hostile responses (Safran & Muran, 1996). Largely corroborating this assumption, a series of studies found that interpersonal problems presenting as being too friendly were associated with better alliances, and problems on the hostile side of the IPC were associated with worse alliances, whereas there were unclear or no associations with the dominance dimension in mixed diagnostic samples (Connolly Gibbons et al., 2003; Dinger & Schauenburg, 2010; Dinger, Strack, Leichsenring, & Schauenburg, 2007; Dinger, Strack, Sachsse, & Schauenburg, 2009; Hersoug, Hoglend, Havik, von der Lippe, & Monsen, 2009; Muran, Segal, Samstag, &

Crawford, 1994; Puschner, Bauer, Horowitz, & Kordy, 2005) as well as specifically for patients with depression (Grosse Holtforth et al., 2014; Renner et al., 2012). As for impact messages, one study (Constantino et al., 2010) found that the early alliance was better when the patients were perceived by their therapists as friendlier. However, no study previously considered the perspective of the patients' significant others to predict the alliance in therapy and no prior study tested the concurrent predictive validity of IIP and IMI ratings. Both of these questions are core aims of study 2 included in this thesis. As for the prediction of cognitive-emotional processing by pre-treatment interpersonal attributes, the very limited data suggests the overall that the mean level of interpersonal problems is of no explanatory value regarding this question (Pos, Greenberg, Goldman, & Korman, 2003). However, by definition hostility should impede cognitive-emotional processing because it is characterized by the avoidance of emotional expression and withdrawal from intimate social relationships and interactions or by actively attacking the interaction partner and keeping him or her at a distance. It was one of the aims of study 2 to validate this previously untested hypothesis all the while considering IIP and IMI ratings concurrently.

As argued above, besides the more general relation between pre-treatment variables and therapeutic process, it would inform tangible therapeutic strategies to know what in-session interactional patterns that unfold between therapist and patient are related to reports regarding the therapeutic alliance and cognitive-emotional processing right after the respective session. To do this, this dissertation project aims at objectifying the moment-to-moment interactions in terms of control and affiliation. Furthermore, it pays particular attention to the role of complementarity, i.e., the interdependency of two interactants' behaviors that is characterized by sameness on

the affiliation axis and difference on the control axis. As reviewed by Tracey (2002), the literature lends partial support to the hypothesis that a high-low-high pattern of complementarity over the course of an entire therapy is associated with good outcome. However, no previous study analyzed the nature of the sequential pattern of complementarity in single psychotherapy sessions. Moreover, no study evaluated whether the same high-low-high progression of complementarity can be found over the course of one session. This is one of the goals of study 3. With regard to the therapeutic alliance and cognitive-emotional processing, no earlier study has ever related the moment-to-moment unfolding of affiliation and control behaviors to session reports after the sessions. Therefore, study 3 tests assumptions that derive largely from theoretical considerations: As explicated in the respective theory section of study 3 in more detail, and analogue to the above-mentioned considerations regarding pre-treatment patient characteristics, warm, sociable, and cooperative therapist behaviors (especially in the face of patient hostility) as well as a deviation from complementarity can be assumed to play a crucial role in the promotion of the alliance and cognitive-emotional processing.

To sum up, besides investigating interpersonal change of depressive psychotherapy patients in relation to treatment outcome, this dissertation project aims at deepening the scientific understanding of the prerequisites for beneficial therapeutic processes. Whereas study 2 relates pre-treatment patient interpersonal characteristics to the patient-rated therapeutic alliance and cognitive-emotional processing, study 3 pursues the target of describing the in-session interpersonal patterns and of relating them to post-session evaluations of the alliance and cognitive-emotional processing.

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2. Empirical Studies

2.1 Study 1: Impact Messages of Depressed Outpatients as Perceived by Their Significant Others: Profiles, Therapeutic Change, and Relationship to Outcome

Martin Grosse Holtforth[a], David Altenstein[a], Emily Ansell[b], Claudia Schneider[c], Franz Caspar[d]

[a]University of Zurich, [b]Yale University School of Medicine, [c]Friedrich-Schiller University Jena, [d]University of Bern

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Abstract

Clinical depression is closely linked to interpersonal factors. Whereas related research frequently focused on patient reports, depressed patients' impact on others is more rarely analyzed. The current study set out to characterize depressed patients' interpersonal style as perceived by their significant others relative to other psychiatric disorders, to investigate the change in depressed patients' interpersonal style over therapy, and to test whether this change was associated with treatment success. We used the data of 832 psychotherapy outpatients, 180 of whom had the principle diagnosis of depression; 59 of the depressed patients also provided IMI data after treatment. There were no differences in the interpersonal octant scores at baseline for those 259 patients who completed IMI after treatment compared to those who did not. Results indicated that depressed patients are perceived as more submissive, hostile-submissive and friendly-submissive, and as less dominant and friendly-dominant than patients with other disorders. Over the course of psychotherapy the 59 depressed patients were perceived as less submissive (friendly-submissive, submissive, hostile-submissive) and more dominant and friendly-dominant, respectively. Whereas a decrease in submissive and hostile-submissive impacts was associated with positive outcomes, the decrease in friendly-submissiveness was unrelated. Exploratory cluster analyses suggested that depressed patients can be further subdivided into four distinct subgroups on the basis of their interpersonal impacts. We discuss these results in terms of interpersonal theory and the clinical relevance of assessment of interpersonal functioning in the psychotherapy for depressed patients.

Depressive disorders are regularly associated with interactional problems (Horowitz, Rosenberg, Baer, Ureño, & Villaseñor, 1988; Joiner & Timmons, 2009) and the relationship between interpersonal behaviors and psychopathology can generally be assumed to be bi-directional: Problematic interpersonal behavior may contribute to psychopathology, and psychological disorders may maintain or even strengthen interpersonal problems (Barrett & Barber, 2007; Cain, Pincus, & Grosse Holtforth, 2010; Pincus & Wright, 2010). Several authors have formulated theoretical expectations about the interpersonal characteristics of depressed people, which lie most frequently in the submissive range (Coyne, 1976; Hammen, 2006; Joiner, 2000; McCullough, 2003). Accordingly, interpersonal behaviors that have been empirically associated with a risk for depression include insecure attachment (Eberhardt & Hammen, 2006), shyness and social withdrawal (Alfano, Joiner, & Perry, 1994), lack of assertiveness (Ball, Otto, Pollack, & Rosenbaum, 1994), or excessive reassurance seeking (Joiner & Metalsky, 2001). However, there is relatively little empirical research on interpersonal patterns in depression (Barrett & Barber, 2007).

Empirical research on interpersonal factors in psychopathology commonly uses methods developed within the interpersonal tradition (Pincus, Lukowitsky, & Wright, 2010). The central assumption is that all interpersonal behavior can be accounted for by a combination of two central descriptive dimensions: *agency* and *communion,* which span a two-dimensional space referred to as the *interpersonal circumplex* (IPC; Alden, Wiggins, & Pincus, 1990; Leary, 1957). The interpersonal space is commonly subdivided into eight “sub-spaces” (octants) representing combinations of agency and communion, such as hostile-submissive or friendly

dominant (Pincus & Gurtman, 2006). Most interpersonal research with depressed subjects so far has focused on interpersonal *problems* (Barrett & Barber, 2007; Vittengl, Clark, & Jarrett, 2003) and self-ratings of interpersonal traits. The present research examines *impact messages* of depressed patients as reported by significant others. *Impact messages* can be defined as experiences of "subtle interpersonal pressures" (Hafkenscheid, 2010; p. 2) in the communication with another person about what he or she wants the other person to do or not to do. The primary instrument to assess impact messages is the Impact Message Inventory (IMI; Kiesler & Schmidt, 2006; see measures section).

Prior research on depressed patient's impact messages indicates perceptions of greater submissivess, but are more unclear regarding levels of friendliness or hostility (Constantino and colleagues, 2010; Gotlib & Whiffen, 1989; Kahn, Coyne, & Margolin, 1985; McCabe & Gotlib, 1993), speaking to the possibility of considerable interpersonal heterogeneity within the group of depressives. In a sample similar to our current sample, depressed German psychotherapy outpatients' impacts being reported by significant others were described as generally more submissive than other psychotherapy patients (Hellwig, 2004). Changes of impact messages over psychotherapy have been researched even less frequently. In Hellwig's study, psychotherapy patients were generally perceived as less submissive, hostile-submissive, and hostile after therapy and a decrease in hostility and in submissiveness as well as an increase in friendliness was associated with better outcomes, However, Hellwig did not specify the results for depressive patients.

Some authors have identified insufficient goal satisfaction as an important etiological factor and as a change target in psychotherapy (Grawe, 2004; Grosse

Holtforth & Michalak, in press; Ryan, Deci, Grolnick, & La Guardia, 2006). Strauman (2002; Strauman et al., 2006) proposed that individuals who are unable to effectively pursue approach (promotion) goals (e.g., having an intimate relationship) are at a higher risk for depression. Empirical studies indicate that problems to attain promotion goals is predictive of depressive symptoms (e.g., Scott & O'Hara, 1993) and that depressed inpatients report lower levels of goal satisfaction than non-depressed controls (Stangier Ukrow, Schermelleh-Engel, Grabe, & Lauterbach, 2007). Interpersonal problems can be viewed as chronic frustrations of important interpersonal goals (Grosse Holtforth, Pincus, Grawe, & Mauler, 2007; Grosse Holtforth, Thomas, & Caspar, 2010). Interpersonal problems that were experienced as being too submissive, and/or too unfriendly were consistently found to be associated with insufficient goal satisfaction (Grosse Holtforth et al., 2007. If psychotherapy indeed helps depressed patients find better ways of satisfying their approach goals by changing interactions with significant others, then improving goal satisfaction can be assumed to be associated with a changing perception of the patients by their significant others (the impact messages).

The current study had the following main goals: First, to characterize depressed patients by their impact messages; second, to analyze the changes of impact messages over psychotherapy; and third, to analyze the relationships of the change of impact messages with treatment outcome. Specifically, we will test the following hypotheses:

H1: In line with Hellwig's (2004) finding of higher submissiveness in her sample of German sample of psychotherapy outpatients we hypothesized that the impact

messages of depressed outpatients are more *submissive*, *hostile-submissive*, and *friendly-submissive* (octant level) and less *dominant* (axis level) than those of patients with other principle diagnoses. We will also explore whether distinct sub-groups of depressed patients can be identified, and whether these subgroups differ with regard to non-interpersonal criteria (gender, comorbidity, type of depressive disorder, prediction of outcome).

H2: Perceptions of interpersonal traits in depressives will change between pre and post psychotherapy in the octant scales of *hostile-submissiveness*, *submissiveness*, and *friendly-submissiveness* as well as in the overall score on the *dominance* axis.

H3: For depressive patients, change of impact messages over treatment in the three submissive octants and the axis *dominance* is associated with changes in depressiveness and with change in satisfaction of approach goals .

Method

Participants

A total of *N* = 180 depressed outpatients (entire outpatient sample: *N* = 832) were assessed for this study. 58.9 % were women (entire sample: 53.6 %) and the mean age was 37.2 years, *SD* = 12.23 (entire sample: 35.8 years, *SD* = 12.0) with a range from 17 to 75 (entire sample: 15-80) years of age. The entire outpatient sample used for the z-standardization of IMI scores was composed of patients with the following disorders: 49 (5.9 %) with MDD, single episode; 108 (13 %) with MDD, recurrent; 23 (2.8 %) with Dysthymia; 6 (0.7 %) with Bipolar Disorder; 23 (2.8 %) with MD, not otherwise specified; 24 (2.9 %) with Obsessive-Compulsive Disorder (OCD); 22 (2.6 %) with a Specific Phobia; 10 (1.2 %) with Generalized Anxiety Disorder

(GAD); 9 (1.1 %) with Post-Traumatic Stress Disorder (PTSD); 87 (10.5 %) with Social Phobia; 65 (7.8 %) with Agoraphobia with or without Panic Disorder; 27 (3.2 %) with an Adjustment Disorder with depressed mood; 37 (4.4 %) with another Adjustment Disorder (i.e. with Anxiety); 65 (7.8 %) did not have a DSM IV-TR Axis I disorder or had an MDD in full remission. One hundred fifteen patients (10.7 %) were assigned to a miscellaneous category of psychological problems other than DSM IV-TR Axis I or II disorders (e.g., marital problems). No diagnostic information was available for 161 patients (19.4 %).

Treatment

Therapists at the University of Bern outpatient clinic differentially combined interventions from CBT, interpersonal, process-experiential, and systemic therapy following a case formulation based on consistency theory (Grawe, 2004). Consistency theory is an integrative framework based on empirically supported general change mechanisms (therapeutic bond, problem activation, resource activation, mastery, and motivational clarification; Grawe, 1997). Average treatment duration was 30.68 sessions (*SD* = 25.66) with a median at 26 sessions. Whereas in the naturalistic setting no adherence checks could be routinely conducted, all therapists had received extensive training in the integrative treatment and received ongoing supervision and/or consultation from experienced colleagues.

Procedures

All participants provided written informed consent as part of intake procedures that their data would be used for research purposes. After a clinical intake interview with an experienced staff psychotherapist, masters-level psychotherapy trainees

administered the Structured Clinical Interview for DSM-IV Axis I Disorders – German Patient Version (SKID-I; Wittchen, Zaudig, & Friedrich, 1997). In addition, patients as well as significant others chosen by the patients completed standardized questionnaires. Based on assessment results, at least three staff psychologists assigned patients to therapists by consensus. Therapists were either masters-level therapists at various stages of their 4-year postgraduate course in psychotherapy or licensed therapists, who provided weekly supervision of the trainees.

Measures

Impact Message Inventory (IMI). The IMI (Kiesler & Schmidt, 2006; German: IMI-RD; Caspar, 2002) is an informant-report scale that assesses the interpersonal impact messages of a target person as reported by a respondent. In the items of the IMI, respondents score their own responses to their target person's interpersonal pulls or invitations, thus providing insight into the target person's distinctive pattern of interpersonal interpersonal style (Horowitz, 2004; Kiesler, 1983). For example, if a respondent endorses feeling "in charge" with the target person, this would reflect that the target person is evoking dominance from the respondent through his or her submissiveness. In the IMI the agency and communion dimensions are labeled as *Dominance* (vs. *Submissiveness*) and *Friendliness* (vs. *Hostility*). In our study, the patients' impact messages were assessed from the perspective of their significant others, most frequently a spouse, a first-degree relative, or a close friend.

Whereas the original IMI consisted of 90 items and 15 scales (Kiesler, 1983), the IMI-C (octant version; Kiesler & Schmidt, 2006) contains 64 items, with 8 scales reflecting each octant of the IPC. The octant scales are labeled *Friendly (LM), Friendly-submissive (JK), Submissive (HI), Hostile -submissive (FG), Hostile (DE),*

Hostile -dominant (BC), Dominant (PA), and *Friendly-dominant (NO)*. Each item is rated on a 4-point Likert scale (1 = extremely inaccurate, 4 = extremely accurate). Mixed support for the circumplex structure of the American IMI-C was found (Schmidt, Wagner, & Kiesler, 1999), as well as for a Dutch translation (Hafkenscheid & Rouckhout, 2009). Fingerle (1998) translated the 64-item IMI-C into German (*IMI-RD*; Caspar, 2002). In this sample the alpha coefficients of the *IMI-RD* octant scores ranged from .65 (friendly-submissive) to .86 (friendly-dominant), matching the reliabilities found for the Dutch translation (Hafkenscheid & Rouckhout, 2009).

To test the IMI for circumplex structure, Tracey's (1997) RANDALL program was used. The program is based on Hubert and Arabic's (1987) proposition to use a randomization test of hypothesized order relations to enable the evaluation of the fit of any pattern model, in this case, circumplex models, to a data matrix of similarities or dissimilarities. The extent to which a given correlation matrix demonstrates a hypothesized ordering can be evaluated with an exact probability, accompanied by a correspondence index. For the current sample, a probability of $p < .001$, with a correspondence index of .86, indicated an excellent fit, suggesting that the scales of the IMI-RD follow a circumplex structure.

Symptom and Outcome Measures.

Beck Depression Inventory (BDI). The BDI (Beck et al., 1978; German: Hautzinger, Stark, & Treiber, 1994) is a 21-item self-report inventory used to assess the severity of depressive symptoms (cognitive, behavioral, affective, and somatic). For each item, subjects select among four responses ranging from 0 to 3 (symptom is not present to symptom is severe). The total BDI score is the sum of all items, and

ranges from 0 to 63. The internal consistency of the German BDI was reported by Steinmeyer (1993) with α = .95.

Brief Symptom Inventory (BSI). The BSI (Derogatis, 1993; German: Franke, 2000) is a 53-item abbreviated form of the Symptom Checklist-90 (SCL-90) that was designed to assess common psychological symptoms. Each item represents a problem, with respondents indicating the extent to which each item has distressed them over the past week. The BSI uses a 5-point response scale ranging from (0) *not at all* to (4) *extremely*. The measure assesses nine symptom dimensions and global symptom severity. We limited our examination to the depressiveness scale as it was considered to most appropriately reflect treatment success in depressed patients. The alpha coefficient of this scale is .87 (Geisheim et al., 2002) in a comparable psychotherapy outpatient sample (N = 1252).

Bern Subjective Well-Being Inventory (BFW). The BFW (Grob et al., 1991) is a 39-item self-report measure that assesses well-being by the scales “positive attitude towards life,” “self-value,” “depressive mood,” “joy in living,” “problem awareness” and “somatic complaints and reactions” on a 5-point response scale. We used the subscale “depressive mood” for our analyses. The BFW has shown adequate test-retest reliability at 2-week follow-up (r=.75) and at 2-year follow-up (r=.50). In a previous study with the same sample, alpha coefficients ranged from .77 to .91 (Cain, Pincus, & Grosse Holtforth, 2010).

Incongruence Questionnaire (INC). The INC (Grosse Holtforth & Grawe, 2003) assesses insufficient goal-satisfaction (incongruence) and consists of 94 items that can be summarized in 14 first-order scales for the satisfaction of approach goals and 9 first-order scales for the coming true of avoidance goals. For our analyses we

used the summary score for incongruence regarding approach goals. Alpha coefficients are reported with .91 (Grosse Holtforth & Grawe, 2003).

Data Analyses

In order to test for differences in impact messages between depressed patients and other patients (hypothesis 1), we conducted a multivariate analysis of variance (Dependent Variables [DVs]: submissive, friendly-submissive, hostile-submissive IMI octants; Independent Variable [IV]: Group = depressed patients vs. other patients with other principle diagnoses). “Depressed patients” and “other patients” were defined by the presence of a principle diagnosis of a depressive disorder. Patients for whom diagnostic information was not available were not included in the analyses. In secondary analyses, we checked for differences in scores on the remaining five IMI octants and the two axes, dominance and affiliation, between depressives and the non-depressed sample using t-tests.

The level and structure of impact messages in patients with depression was examined using the *structural summary method for circumplex data* (Gurtman, 1994; Pincus & Gurtman, 2003; Wright et al., 2009) which models the pattern of octant scores to a cosine-curve function (for more details: Gurtman & Balakrishnan, 1998; Wright et al., 2009). Accordingly, the IMI-RD profile is decomposed into two parts: A structured component (cosine function) reflecting the prototype for a circumplex as well as a deviation component. The parameters of this curve are its (a) angular displacement (the peak-shift of the curve) from 0°; (b) amplitude, or peak value; and (c) elevation, or mean level. The coordinates in the analysis are the polar angles of the octant scales (e.g., PA at 90°, BC at 135°, etc). The goodness-of-fit of the

modeled curve to the actual scores can be calculated by an R^2 value, which essentially indicates the degree to which the profile conforms to prototypical circumplex expectations. The *angular displacement* of the curve indicates the person's interpersonal central tendency, signifying the individual's typology (Leary, 1957) or predominant interpersonal theme (Kiesler, 1996). For example, an angle of 45° suggests the central interpersonal qualities of self-assurance, sense of responsibility, and enterprising (friendly-dominance); 225° suggests insecurity, avoidance of responsibility, and so on. *Amplitude* is a measure of profile differentiation (Wright et al., 2009) and is viewed as a measure of the profile's differentiation, indicating the extent to which the predominant trend stands out. An amplitude value of 0 indicates a flat (i.e., undifferentiated) profile; high amplitude indicates a profile with a clear interpersonal peak (and trough). *Elevation*, or the mean level of the curve, is--in the context of maladjustment measures -- an index of global level of interpersonal distress. In case of the IMI however, this parameter is rather meaningless and is reported here for reasons of completeness only. To the extent that a group's profile exhibits non-trivial amplitude (i.e., is differentiated) and conforms well to circumplex expectations (i.e., $R^2 \geq .70$), the group may be distinctively characterized by the prototypical interpersonal style indicated by the profile's angular displacement and the salience of this interpersonal style as indexed by the profile's elevation (Wright et al., 2009).

For the classification of depressed patients, we used cluster analyses of IMI scores on the dimensions of Dominance and Affiliation. Because the structural summary method does not allow for between-group statistical comparisons of

interpersonal data, we calculated circular means, circular variances, and 95% circular confidence intervals (CI) for each group (Wright et al., 2009). The circular mean represents the average of the angular displacements for each individual within the group. The circular variance refers to the dispersion of the angular displacements of individuals within a given group around the circular mean. CIs are calculated as a way of identifying reliable differences in group's circular means, allowing for a statistical comparison between each corresponding cluster, with the expectation that each pair of CIs will not overlap (Wright et al., 2009). Chi-Square analyses examined differences between the clusters of depressed patients regarding non-interpersonal criteria.

Changes of impact messages over treatment (hypothesis 2) were tested by computing a repeated-measures multivariate analysis of variance (DVs: submissive IMI octants; IV: time) with Games-Howell corrections. Secondary analyses regarding the change of non-submissive octants were conducted using t-tests. Additionally, we assessed how many patients changed in a clinically significant way. For that purpose, we calculated the percentage of patients with an individual reliable-change index of greater than 1.96, as recommended by Jacobson and Truax (1991). In order to test the association of change in interpersonal style with treatment success (hypothesis 3), we correlated pre-post differences in IMI octants with pre-post differences in depressiveness (BDI, depressiveness scales of the BSI & BFW) and with the pre-post difference in satisfaction of approach goals (INC).

Depressed patients who had missing data after treatment (n = 121) did not differ from those patients whose significant others completed the post-questionnaire

(n = 59), neither in demographic variables (age: F = 0.05, df = (1, 146), p = .825, and partial $\eta^2 < .001$; sex: χ^2 (2) = 0.17; p = .918) nor in their depressiveness (assessed by the BDI) before treatment (F = 0.11, df = (1, 166), p = .739, and partial η^2 = .001), nor in their IMI octant scores before treatment (Pillai's Trace = .066, F = 1.50, df = (8, 171), p = .16, and partial η^2 = .066). The main reason for missing data was that significant others did not return questionnaires at follow-up. Therefore, we included in analyses that tested change hypotheses (H2 & H3) only those patients who had data at follow-up.

Results

Descriptives of depressed patients' and other patients' interpersonal styles are shown in Table 1. Of the N = 180 depressed patients completing questionnaires before therapy, 11 (6.1 %) prematurely dropped out of therapy. Of these, 3 dropped out between the first and the fifth session, 4 dropped out after session 5, 1 was referred to another therapist in the same outpatient clinic, 1 stopped treatment for financial reasons, and 1 had merely paused treatment. The reasons for dropout were not systematically assessed. The rest of the missing data at post were attributable to patients' significant others not returning questionnaires despite the patients completing the treatment regularly.

Characterization of depressed patients' interpersonal style (H1)

We first compared depressed patients with other psychotherapy patients, and subsequently identified interpersonal subgroups of depressed patients.

Depressed patients vs. other patients. The MANOVA yielded a significant main effect for group (patients with principle diagnosis of depression vs. other principle diagnoses), Pillai's Trace = .017, F = 3.85, df = (3, 667), p = .01, and partial

η^2 = .017. Post-hoc analyses of between-subjects effects and secondary analyses (t-tests) of specific variables indicated the differences, as shown in Table 1. As hypothesized, depressed patients were perceived as more submissive, hostile-submissive, and friendly submissive than the general patient sample. Moreover, depressives scored lower on dominant and friendly-dominant scales. The interpersonal impact message of the depressed sample (see Table 2) indicates that, on average, depressed patients were pereceived in the HI octant (250.90º), reflecting a submissive interpersonal style. The structural summary parameters of amplitude (.207) and R^2 (.91) indicate that the depressed patients' profile exhibits low interpersonal differentiation, but conforms well to prototypical circumplex expectations.

Interpersonal classification of depressed patients. To test whether multiple interpersonal profiles are detectable in the sample of depressed outpatients, scores on the two dimensions of the IMI (Dominance and Love) were cluster analyzed. Two-, three-, and four-cluster solutions were examined, and a four-cluster solution exhibited the most robust replication across Ward's (1963) hierarchical clustering method and an agglomerative clustering method (K-Means), using squared Euclidean distances (see Figure 1): 71.4% of Ward Cluster 1 (n = 35) were grouped into KM Cluster 1 (n = 29); 72.1% of Ward Cluster 2 (n = 86) were grouped into KM Cluster 2 (n = 67); 88.9% of Ward Cluster 3 (27) were grouped into KM Cluster 3 (n = 48); and 96.9% of Ward Cluster 4 (32) were grouped into KM Cluster 4 (n = 36). A chi-square analysis indicated similarity of groups across cluster algorithms, χ^2 (9) = 313.95; $p < .001$. Because K-Means is especially sensitive to outliers, we examined

our data for extreme or highly discrepant cases in each cluster. There were no highly discrepant cases in either cluster; therefore, we did not exclude any cases from subsequent analyses. The Ward clusters were used for all subsequent analyses.

To characterize the clusters of depressed patients, structural summaries were computed for each cluster. Results of the structural summary method (see Table 2), i.e., the angular displacement, indicate that Cluster 1 displays a hostile interpersonal style, Cluster 2 displays a friendly-submissive style, Cluster 3 is best characterized as friendly-dominant, and Cluster 4 as hostile-submissive. The overall perception of depressed patients was primarily perceived as submissive, but the additional circumplex indices of amplitude and R^2 show that the four specific subgroups of depressed patients exhibit an even better circular prototypicality than the depressed sample as a whole.

Differences between interpersonal clusters of depressed patients. Table 2 presents the circular means, variances, and 95% CIs for the four new clusters. It is important to note that the CIs of the four interpersonally-based clusters do not overlap, providing further evidence that individuals within each of these clusters are experienced by their significant others as having distinct interpersonal styles. To examine differences between the clusters, Chi-Square analyses were conducted regarding gender composition, diagnostic comorbidities, type of dysphoric disorder (MDE, single episode; MDE, recurrent; Dysthymic disorder). The results indicated no difference regarding the frequencies of specific types of dysphoric disorders (χ^2 (6) = 6.049; p = .418) as well as no differences in percentage of men and women in each cluster (χ^2 (6) =4.40; p = .623). Similarly, Chi-Square analyses indicated no significant differences in percentage of comorbid diagnoses in each cluster (χ^2 (3) =

0.58; p = .900). Outcomes (BDI, BSI, BFW, and INK pre-post) did not differ between the interpersonal clusters (p>.48), but interpersonal groups were quite small at post (N = 9 to 33). Dropout rates were evenly distributed among the interpersonal clusters (χ^2 (3) = 3.06; p = .382) and treatment duration did not differ between the interpersonal clusters (F = 0.25, df = (3, 142), p = .86, and partial η^2 = .005.

Interpersonal subclusters and depressive sub-diagnoses. Further examining the relationship between the type of dysphoric disorder and interpersonal style we compared the diagnostic subtypes regarding interpersonal styles as indicated by IMI scale scores. We found a significant main effect for diagnostic group (MANOVA with MDE, single episode vs. MDE, recurrent vs. Dysthymia as fixed factor and IMI octants as DV's), Pillai's Trace = .154, F = 1.78, df = (16, 342), p = .03, and partial η^2 = .077, as well as significant post-hoc differences on all IMI octants. At first sight this finding appears to be in contrast to the finding of no relationship between diagnostic and interpersonal clusters. However, structural summaries of the three diagnostic sub-groups reveal that the three groups' angular displacement is roughly the same (235°-277°; between friendly-submissive and submissive), that they differ primarily in amplitude (0.15-0.55) and that the model fit of the diagnostic groups (R^2 = .82 - .94) are worse than with the interpersonal clustering method (see Table 2). Apparently, differences in interpersonal style between MDE, single episode, MDE, recurrent, and Dysthymia are primarily of prototypicality, not differences in interpersonal impact.

Change of interpersonal style over treatment (H2)

The repeated measures MANOVA (n = 59) yielded a significant main effect for

time (Pillai's Trace = .489, $F = 17.86$, $df = (3, 56)$, $p < .001$, partial $\eta^2 = .489$). As hypothesized, scores of the three submissive octants significantly decreased over the course of treatment (all p's<.01). Additional explorative t-tests revealed an increase in depressed patients' dominance and friendly-dominance (p<.01) as well as a decrease in hostility (p<.05). Effect sizes of all significant differences were at least moderate and ranged from $d = 0.29$ to $d = 0.66$. For each of the three submissive octants, more than half of the patients changed reliably with an individual RCI > 1.96 (Jacobson & Truax, 1991: hostile -submissive 66%; submissive 53%; friendly-submissive 86%. Therefore as hypothesized, depressed patients' IMI-RD scores changed beyond measurement error in the submissive octants.

Relation of change in interpersonal style with treatment outcome (H3)

Table 3 shows the association between change in IMI octants and in IMI axes with outcome. Results indicate that (a) the bigger the decrease of submissive and hostile-submissive styles, the more the depressiveness and the incongruence regarding approach goals decreases; however, (b) for the friendly-submissive octant, there is no such association with treatment outcome. Change in interpersonal style did not correlate significantly with treatment duration (all p's > .15).

Discussion

The current study addressed two major aims. The first aim was to characterize depressed patients' interpersonal style as perceived by their significant others. The second aim was to investigate the change in depressed patients' interpersonal style over therapy and its association with treatment outcome. As hypothesized after therapy, depressed patients were perceived as more submissive, hostile-submissive, and friendly submissive by their significant others than all other

psychotherapy patients by their respective significant others. Moreover depressed patients scored lower on dominant and friendly-dominant scales. Cluster analysis revealed that, although the depressed sample as a whole is best characterized by its submissiveness, there are four distinct subgroups of depressed patients whose circumplex characteristics are best labeled as friendly-dominant, friendly-submissive, hostile-submissive, and hostile-dominant. Over therapy, depressed patients decreased on the three submissive and the hostile circumplex octants and became more dominant and friendly-dominant, respectively. The assumed association with treatment success was partially supported: The decrease of submissive and hostile-submissive styles was associated with positive outcome, whereas the change in friendly-submissiveness was unrelated to outcome.

The characterization of depressed patients' interpersonal style as generally more submissive, hostile-submissive, or friendly-submissive than all other psychotherapy patients confirmed our hypotheses. The findings of lower scores on dominant and friendly-dominant scales are in accordance with these findings, considering the circumplex structure of the IPC. The exploratory finding that significant others seem to perceive greater levels of hostility only in the form of hostile-submissiveness, however, is in contrast to findings of, e.g., Constantino et al. (2008), who found generally more hostile impacts of their chronic depressed patients.

Our cluster analyses also confirmed the clinical truism that depressed patients are a very heterogeneous group also with respect to interpersonal styles as perceived by significant others. The interpersonal clustering did not relate to diagnostic subclassifiation of depressed patients. The identified four interpersonal

subgroups of depressed patients exhibited highly prototypical circumplex profiles and non-overlapping circular confidence intervals, suggesting that the significant others of the depressed patients within each of the subgroups reported clearly distinct interpersonal styles. The four identified interpersonal groups of depressives roughly cover all areas of the interpersonal circle: Friendly-dominant depressives, friendly-submissive depressives, hostile-submissive depressives, and hostile-dominant depressives. Whereas the heterogeneity in impact messages of depressed patients was not attributable to gender, type of dysphoric disorder, or the co-morbid diagnoses, the subgroups differed in size: Whereas almost half of the depressed patients were in the friendly-submissive cluster, the remaining half distributed fairly evenly over the other clusters.

The analysis of changes of interpersonal impacts over therapy was guided by the assumption that those interpersonal impacts that will change the most are also those which are most characteristic of depressed patients. This assumption was confirmed by the findings that the patients were perceived as generally less submissive (friendly submissive, less submissive, and less hostile-submissive) after therapy. The assumption that therapy will change the interpersonal style most characteristic of depressed patients (variants of submissiveness) also implied that these changes were associated with treatment success for the depressed patients. Our results suggest that this assumption needs to be differentiated further. Although symptom reduction was associated with less submissive and hostile-submissive impacts as perceived by significant others, the change of friendly-submissiveness was unrelated to outcome. It might be that the friendly subtype of submissiveness is the least in conflict with the patients' current interpersonal context and might at times

even be an asset. However, in other contexts, the same analysis may have yielded different results. Whereas in one cultural context a friendly-submissive person might figure as a nice and cooperative neighbor, the same person might be perceived as a naïve weakling in another culture or subculture.

The current study has several limitations. A possible limitation was the naturalistic design of the study. On the one hand, the day-to-day collection of data from patients and their significant others in routine treatment provided data of high external validity and increased variability among patients as compared to patients in a highly controlled treatment protocol. On the other hand, internal validity, conclusions being possibly drawn, and the generalizability of our results to all depressed people is limited. Furthermore, there was no standardized assessment of personality disorders, nor a specific assessment of chronic depression in the clinic. Whereas chronic depression is not a formal diagnosis in DSM-IV, the assessment of both personality disorders and depression chronicity would provide valuable information for purposes of characterization and validation of the depressive subgroups. Our sample of German-speaking Swiss patients may also restrict the generalizability of the results to other cultures. Furthermore, there was a considerable reduction of the sample size from pre- to post-treatment. 67 % of the depressed patients did not complete the post-treatment assessments due to a number of factors, limiting the statistical power and prohibiting extensive analyses of subgroups. Despite the fact that we did not find any significant differences between patients with missing data versus not at post treatment in terms of demographic data or diagnoses, the results regarding changes, and associations of changes with

outcome need to be treated with caution, especially with regard to the cluster-analytically defined subgroups of depressed patients. Finally, the identification of four distinct clusters of depressed patients may be sample-specific and needs further replication in other samples of depressed in- and outpatients.

Potential clinical implications of this study concern clinical assessment as well as psychotherapeutic treatment. Knowledge about the interpersonal impact of depressed patients on others may provide diagnostic information that might not be available by other sources (McLemore & Benjamin, 1979; Pincus & Wright, 2010). Information on patients' interpersonal style as perceived by their significant others might prepare testing and validating therapists' clinical impressions or patients' self-reports. In addition, assessment of changes in interpersonal style as perceived by others may represent an important outcome criterion when interpersonal change is considered a major goal of treatment. With regard to psychotherapy, the assessment of a patient's impact on significant others may help to better understand the patient's diagnostic presentation and prepare a tailored case formulation and treatment plan (Westen, Novotny, & Thompson-Brenner, 2004). Clinically, it seems that many depressed patients may profit from interventions trying to change overly submissive behaviors such as assertiveness training, in order to enable them to approach satisfying activities more directly. Assuming that a patient's presentation to significant others can be generalized to the patient's behavior in therapy, the therapist may be better prepared for potential interactional pitfalls in therapy (Safran & Muran, 2000).

Future studies should examine larger samples of patients that include inpatients as well as outpatients from various sites, and employ more stringent

methods of collecting follow-up data. In addition, assessing for chronic depression would allow for comparison with the results obtained by Constantino et al. (2008). This research should also be replicated in depressed patients of diverse cultural background as to examine the international and intercultural generalizability of results. In addition, future research should examine the generalizability of interpersonal style across methods of assessment including self-report and observer-rated methods. Future research could extend the current study regarding psychopathology, therapeutic process as well as mechanisms of change in psychotherapy. Future studies may also investigate whether an approach that is more interpersonally focused (e.g. Interpersonal Therapy; Weissman, Markowitz, & Klerman, 2000) would yield different results, particularly regarding interpersonal changes and their associations with outcome. Furthermore, advanced longitudinal designs with several assessment points would allow for testing causal hypotheses. Testing predictions of psychotherapy process by interpersonal style such as alliance development and alliance ruptures (Constantino et al., 2010) could improve early identification of patient-therapist dyads likely to face interactional problems in the course of therapy. Whether the classification of depressed patients in one of the four identified interpersonal subtypes contributes to outcome prediction and maybe used for differential indication, also needs to be studied in future research.

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Table 1

IMI scores at intake and IMI change for depressed patients

	Group	Depressed patients (*n = 180*)	Patients with other principle diagnoses (*n = 491*)	Depressed patients vs. patients with other principle diagnoses			Pre-post change for depressed patients			
		M (*SD*) [a]	*M* (*SD*)	Δ	*SE*	*d* [b]	Δ	*SE*	*d* [a]	% RC[b]
Octants	Dominant	-.19 (1.06)	.03(.98)	-0.22	0.09	-0.22*	-0.40	0.19	-0.42**	66%
	Hostile-dominant	.00 (1.04)	.01(.99)	-0.01	0.08	-0.01	0.14	0.18	0.15	58%
	Hostile	.09 (0.98)	-.02(1.01)	0.11	0.08	0.11	0.29	0.19	0.29*	71%
	Hostile-submissive	.22 (0.93)	-.01(1.02)	0.23	0.08	0.24**	0.59	0.19	0.66**	66%
	Submissive	.17 (0.94)	-.02(1.04)	0.20	0.08	0.20*	0.32	0.19	0.35**	53%
	Friendly-submissive	.21 (0.92)	.04(1.02)	0.26	0.08	0.27**	0.59	0.19	0.61**	86%
	Friendly	-.07 (0.93)	.01(1.03)	-0.09	0.08	-0.09	-0.06	0.18	-0.06	83%
	Friendly-dominant	-.14 (0.99)	.03(1.00)	-0.18	0.08	-0.18*	-0.38	0.19	-0.41**	59%
Axes	DOMINANCE	-.20 (0.84)	.03(.90)	-0.23	0.07	-0.26**	-0.43	0.19	-0.52**	n. a.
	LOVE	-.07 (0.78)	.01(.79)	-0.07	0.07	-0.09	-0.18	0.18	-0.24*	n. a.

Note. Variables that were mentioned in hypotheses are italicized. ; *$p < .05$; **$p < .01$; [a] *z-scores;* [b] Effect size Cohen's *d* was calculated

$d = \frac{M_{pre} - M_{post}}{SD_{pooled}}$; [c] reliably changed = RCI > 1.96; n.a.= not applicable

Table 2

Structural summaries of all depressed patients and depressed sub-groups.

			Interpersonal clusters				Depressive Subdiagnoses		
		All Depressed	Cl. 1	Cl. 2	Cl. 3	Cl. 4	MDE, single episode	MDE, recurrent	Dysthymia
	n	180	35	86	27	32	50	107	23
Structural summary	Displacement	250.90°	160.39°	316.79°	59.85°	231.64°	277.21°	252.48°	235.24°
	Amplitude	.21	.82	.51	1.14	1.65	0.15	0.17	0.55
	Elevation	.04	0.10	0.02	0.07	0.01	0.09	0.01	0.15
	R^2	0.91	0.95	0.96	0.98	0.98	0.87	0.82	0.94
Circular statistics	Mean	291.79	167.08	323.63	61.97	231.76	319.81	290.98	265.23
	Variance	80.45	37.24	49.71	19.01	20.66	80.48	81.82	69.87
	95% CI high	303.54	179.41	334.14	69.14	238.92	342.12	306.34	293.79
	95% CI low	280.04	154.74	313.13	54.8	224.6	297.50	275.62	236.68

Note. MDE 5 Major Depressive Episode; CI = confidence interval.

Table 3

Correlation of pre-post change in IMI octants with pre-post change in outcome measures for depressive patients

	BDI	BSI depr.	BFW depr.	INC approach
n	42	44	44	44
Octants				
Dominant	-.28*	-.12	-.12	-.29*
Hostile-dominant	.15	.14	.05	.09
Hostile	.19	.12	-.04	.18
Hostile-submissive	.31*	.27*	.32*	.34*
Submissive	.33*	.22	.28*	.28*
Friendly-submissive	.13	-.02	.09	-.02
Friendly	-.19	-.28*	-.12	-.11
Friendly-dominant	-.30*	-.14	-.04	-.14
Axes				
DOM	-.32*	-.16	-.21	-.27*
LOV	-.26*	-.28*	-.09	-.24

Note. All Correlations are Pearson's *r*.; $^{*}p < .05$

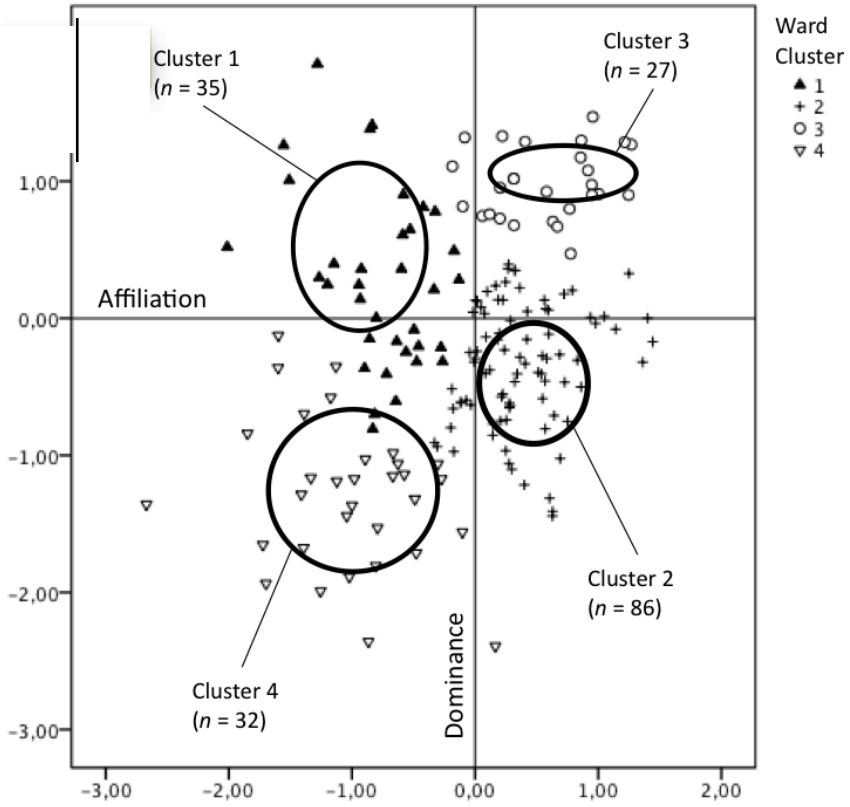

Figure 1. Location of the depressed sub-groups with respect to the aces Dominance and Affiliation.

2.2 Study 2: Self-reported Interpersonal Problems and Impact Messages as Perceived by Significant Others and their Differential Prediction of Depression Therapy Process and Outcome

David Altenstein[a], Johannes Zimmermann[b], Tobias Krieger[a,c], Nadja Dörig[a], Martin grosse Holtforth[a,c]

[a]University of Zurich, [b]University of Kassel, [c]University of Bern

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Abstract

Objective: Interpersonal factors play a major role in causing and maintaining depression. It is unclear, however, who provides the most valid information on patient interpersonal style. Our study sought to investigate how patients' self-perceived interpersonal problems and impact messages as perceived by significant others are interrelated, change over therapy, and differentially predict process and outcome in psychotherapy of depression.

Method: 143 outpatients with MDD were treated by 24 therapists with CBT or Exposure-Based Cognitive Therapy. Interpersonal style was measured pre and post therapy with the self-report Inventory of Interpersonal Problems (IIP) and with the informant-based Impact Message Inventory (IMI). Patients' dominance and affiliation as well as interpersonal distress were calculated from these measures. Depressive and general symptomatology was assessed at pre, post, and at three months follow-up. Furthermore, patient-reported process measures were assessed after every session.

Results: IIP and IMI correlated moderately on their respective dominance dimensions, but did not correlate on affiliation. IIP affiliation was the best predictor of the early therapeutic alliance and of cognitive-emotional processing. Whereas IIP affiliation and IMI dominance increased over therapy, IIP distress decreased. While a pre-post decrease in IIP distress was related to pre-post symptomatic change, the best predictor of outcome three months post therapy was an increase in IMI dominance.

Conclusions: Significant others seem to provide important additional information about the patients' interpersonal style and therefore should be included

in the diagnostic process. Moreover, practitioners should specifically target interpersonal change as a potential mechanism of change in psychotherapy for depression.

Unipolar Major Depression is a significant health problem. Its lifetime prevalence among the adult US population is 21 % (Kessler et al., 2005) and by 2020 the disorder is projected to be the second leading cause of disability worldwide, surpassed only by cardiovascular disease (Murray & Lopez, 1997). Depression and interpersonal factors influence each other: There are interpersonal risk factors that predispose an individual for the development of depression and an individual's suffering from depression affects other people in various ways (Hames, Hagan, & Joiner, 2013). Accordingly, on the basis of a comprehensive review of empirically validated psychotherapies (Nathan & Gorman, 2002), an APA Division 12 Task Force synthesized empirically-derived principles of therapeutic change and concluded that, in order for psychotherapy to most effectively alleviate depression, among others, it should specifically target the patients' interpersonal functioning (Follette & Greenberg, 2006). However, when trying to implement this recommendation, practitioners are faced with the largely unanswered but crucial question of who provides the most valid information for interpersonal diagnosis and case formulation: The patient him- or herself or those that most frequently interact with him or her, i.e. the patients' significant others. Already in their milestone article that paved the road for current scientific diagnostic methodology Spitzer, Endicott, and Robins (1978) recommended gathering information about the patient from as many sources as possible. Lending empirical support to this recommendation, Achenbach et al. (2005) aggregated the results of 108 studies investigating self-/other ratings of psychopathology and found only moderate correlations between the two perspectives, especially when the ratings are based on different instruments. Consequently, they argue for systematically obtaining multi-informant data.

A pantheoretical model particularly suited for assessing interpersonal characteristics of groups or individuals is the interpersonal circumplex model (Horowitz & Strack, 2011). First proposed by Leary (1957), the interpersonal circumplex (IPC) is defined by two orthogonal axes: A horizontal axis of *affiliation* (also: solidarity, friendliness, warmth, love, or communion) with its poles friendly and hostile, and a vertical axis of *dominance* (also: power, control, or agency) with its poles dominant and submissive. Each point within the IPC can be defined by a combination of the values on these two variables (x- and y-axes) and the resulting localization in a two-dimensional space. A number of assessment methods have been developed based on this model, generally referred to as *circumplex measures* (for review, see Locke, 2011). These questionnaires generally divide the circle into eight segments. Each of these octants represents a blend of the above-mentioned two axial dimensions. To characterize an individual or a group, it is possible to either report a profile score based on all octants or use the scales to calculate two (x- and y-) axis scores, reflecting affiliation and dominance. Two of the most popular and widely used circumplex measures in clinical psychology are the Inventory of Interpersonal Problems (Horowitz, Alden, Wiggins, & Pincus, 2000) and the Impact Message Inventory (Kiesler & Schmidt, 2006). The former is used as a self-report measure to assess interpersonal problems associated with each octant of the IPC. The latter assesses the covert reactions (feelings, thoughts, and action tendencies) that a target person evokes in another person. Both questionnaires have been used in an attempt to investigate the interpersonal characteristics of depressive individuals. Overall, IIP self-report ratings (Barrett & Barber, 2007; Cain et al., 2012; Grosse Holtforth et al., 2014; Vittengl, Clark, & Jarrett, 2003) and IMI ratings by

significant others (Grosse Holtforth, Altenstein, Ansell, Schneider, & Caspar, 2012) or therapists (Constantino et al., 2008) generally converge in characterizing the interpersonal style of patients with depression as ranging from friendly-submissive to hostile-submissive. In other words, empirical findings portray depressive patients, on average, as a group that is characterized by social isolation, avoidance of social situations, lack of assertiveness, and/or being distant; all in all reflecting a socially avoidant interpersonal style. However, these average group profiles do not answer the crucial questions how self-reported interpersonal problems of a particular depressive patient are associated with the covert reactions this target person elicits in others, and which of the two perspectives may be more helpful for treatment planning. Therefore, our study investigates how self-reported interpersonal problems of psychotherapy patients with depression and the impact messages as perceived by their significant others are associated with each other, change over therapy, and differentially predict therapy process and outcome. For the sake of scientific efficiency, instead of formulating assumptions about all IIP and IMI octants we base our following hypotheses on the respective dominance and affiliation dimensions of the IIP and the IMI and on interpersonal distress as measured by the IIP (Grosse Holtforth, Lutz, & Grawe, 2006).

Associations of Interpersonal Problems with Impact Messages

With regard to self- and other-reported interpersonal problems, some studies found moderate agreement among the two perspectives (Foltz, Morse, & Barber, 1999; Ready & Clark, 2002; Saffrey, Bartholomew, Scharfe, Henderson, & Koopman, 2003). However, the empirical evidence linking self-reported interpersonal problems and informant-reported impact messages is limited. An early study (Wagner, Kiesler,

& Schmidt, 1995) demonstrated general structural convergence of the IIP and the IMI: The scales of the two measures were aligned in a way that is consistent with interpersonal circumplex predictions (Locke, 2011). Another study (Chen & Mallinckrodt, 2002) calculated difference scores between the eight IIP and the corresponding IMI scales, but did not report the associations between them. Whereas in a recent study with depressive psychotherapy patients (Quilty, Mainland, McBride, & Bagby, 2013) the authors did not find any significant associations between the affiliative dimensions of the IIP (self-reported) and the IMI (as perceived by the therapists), surprisingly, a negative association on the dominance dimension of the two instruments was identified. This result stands in contrast to the above-mentioned consistent agreement between self-reported and informant-reported IIP ratings (Foltz et al., 1999; Saffrey et al., 2003). However, because the therapists completed the IIP at different time points than the patients completed the IIP, this finding needs to be treated with some caution before drawing any conclusions.

Based on the above-mentioned previous research, we expect (1) low to medium correlations between corresponding IIP and IMI dimensions of dominance and affiliation, respectively. Additionally, we will check for possible moderators of the associations between IIP and IMI, such as chronicity of depression, severity of depressive symptoms, sex, and the type of the relationship of the significant other to the target person of the IMI.

Prediction of Psychotherapy Process

In a next step, we were interested in predicting the quality of the therapeutic process from the IIP and IMI pre-treatment data. As the abundance of process-outcome research during the past decades has shown (Crits-Christoph, Connolly

Gibbons, & Mukherjee, 2013), the therapeutic alliance (Horvath, Del Re, Flückiger, & Symonds, 2011) as well as cognitive-emotional processing (Greenberg & Pascual-Leone, 2006; Yeryomenko, 2012) are among the process variables that are most strongly and most consistently related to therapy success. However, research on the relation between interpersonal constructs and the therapy process is very limited.

As for the alliance, several theorists argue that the development of a positive and stable therapeutic alliance (positive bond, agreement about goals and tasks; Horvath, 2001), should be particularly difficult to establish with patients who are critical, cold, and/or withdrawn, given the natural tendency of hostile patient behavior to elicit complementary counter-hostile responses (Safran & Muran, 1996). Largely corroborating this assumption, a series of studies found that interpersonal problems presenting as being too friendly were associated with better alliances, and problems on the hostile side of the IPC were associated with worse alliances, whereas there were unclear or no associations with the dominance dimension (Connolly Gibbons et al., 2003; Dinger & Schauenburg, 2010; Dinger, Strack, Leichsenring, & Schauenburg, 2007; Dinger, Strack, Sachsse, & Schauenburg, 2009; Hersoug, Hoglend, Havik, von der Lippe, & Monsen, 2009; Muran, Segal, Samstag, & Crawford, 1994; Puschner, Bauer, Horowitz, & Kordy, 2005). However, all of the above studies were conducted with samples consisting of patients with a broad range of psychiatric disorders. Two recent studies investigated this association specifically for depressed patients: Renner et al. (2012) found that IIP affiliation positively predicted the alliance, whereas IIP dominance and IIP distress both were negatively related to the alliance. A recent study (Grosse Holtforth et al., 2014) identified subgroups of patients based on their interpersonal problems and found the

hostile and extremely hostile-submissive subgroups to show the worst alliances, whereas the extremely friendly-submissive patients reported the best alliances.

As for impact messages, the empirical evidence is scarce when it comes to the prediction of the alliance. Based on a sample of chronically depressed patients, one study (Constantino et al., 2010) found that the early alliance was better when the patients were perceived by their therapists as more affiliative. To our knowledge, our study is the first to use IMI data generated by the patients' significant others in order to predict the early alliance and the first to test the concurrent predictive validity of IIP and IMI ratings. The above-mentioned previous studies demonstrated a particularly strong link between pre-treatment interpersonal factors and the alliance level during the first few sessions of therapy. The early alliance, in turn, is a highly consistent predictor of outcome (Horvath et al., 2011). Therefore we will use the interpersonal variables to predict the alliance averaged across the first five sessions of therapy. Based on the above-mentioned theoretical considerations and previous research we hypothesize that (2) the affiliation dimensions both of the IIP and of the IMI positively predict the quality of the alliance early in therapy. In an additional analysis, we will test the concurrent predictive validity of IIP and IMI dominance and affiliation as well as of IIP general distress.

The second process variable we aimed at predicting from interpersonal characteristics was cognitive-emotional processing. This two-fold construct comprises emotional arousal during the session as well as acquiring a cognitive understanding of one's own problems (Greenberg & Pascual-Leone, 2006; Yeryomenko, 2012). By definition hostility should impede cognitive-emotional processing because it is characterized by the avoidance of emotional expression and

withdrawal from intimate social relationships and interactions or by actively attacking the interaction partner and keeping him or her at a distance. So far, the scarce empirical evidence suggests that it is not the mean level of interpersonal problems (Pos, Greenberg, Goldman, & Korman, 2003), but rather the nature of the concrete interaction of patient and therapist (Altenstein, Krieger, & Grosse Holtforth, 2013) that facilitates or hinders cognitive-emotional processing. To our knowledge, our study is the first to directly investigate the relationship between specific pre-treatment interpersonal characteristics and cognitive-emotional processing during therapy.

Cognitive-emotional processing itself has been shown to increase over the course of treatment, and its level in the middle and late phases of treatment seems to be a particularly good predictor of outcome (Pos, Greenberg, & Warwar, 2009). Therefore, we will use interpersonal variables to predict cognitive-emotional processing averaged over all therapy sessions. We expect (3) the IIP and IMI affiliation dimensions to negatively predict the mean level of cognitive-emotional processing during therapy. We also tested the concurrent prediction of cognitive-emotional processing by the five above-mentioned IIP and IMI subscales (i.e. IIP affiliation, IIP dominance, IMI affiliation, IMI dominance, and IIP general distress).

Change of Interpersonal Problems and Impact Messages over Therapy

Additionally, we were interested in the questions of how depressed patients' interpersonal problems and their impact messages change over therapy, and whether they change convergingly or differentially. Several previous studies investigated this question by taking into account either one of the two constructs alone. To our knowledge, however, there is no study that directly compares how IIP and IMI change (differentially) over therapy. This question is important not only

scientifically but also clinically, because many practitioners exclusively rely on information provided by the patient.

As for interpersonal problems, several studies have found that patients with depression change over the course of psychodynamic therapy (Horowitz, Rosenberg, & Bartholomew, 1993), psychoanalysis (Huber, Henrich, & Klug, 2007), cognitive-behavioral therapy (Vittengl et al., 2003), as well as integrative cognitive psychotherapy (Grosse Holtforth, Altenstein, Wright, Ansell, & Caspar, 2011) in a highly convergent way: The scores on all octant scales decrease significantly. Above and beyond a general change in severity, so far no significant changes could be found in the specific interpersonal dimension of these measures, i.e., neither for the dominance dimension nor for the affiliation dimension of the IIP (Quilty et al., 2013; Renner et al., 2012; Vittengl et al., 2003). As for impact messages, there are only few studies that investigated change over the course of psychotherapy for depression. Chronically depressed patients' IMI scores were found to decrease most readily in submissive, hostile, and hostile-dominant octants, whereas they increased in the friendly-submissive and friendly-dominant scales (Constantino et al., 2008). A more recent study generally corroborated these results and additionally found an increase in both the IMI affiliation and dominance dimensions (Grosse Holtforth et al., 2012). These results contrast the null findings in dimensional IIP change (Renner et al., 2012; Vittengl et al., 2003).

To further investigate this important differentiation between self-reported interpersonal problems and other-reported interpersonal impacts we will calculate IIP and IMI change on the dominance and affiliation dimensions as well as the IIP general distress factor. In these analyses, we will test the following hypotheses: (4)

The IIP general distress factor will decrease over therapy whereas the IIP dimensions (dominance, affiliation) will remain constant. (5) The IMI dimensions of dominance and affiliation will both increase. Accordingly, (6) we do not expect any significant associations between IMI and IIP dimensional changes.

Prediction of Psychotherapy Outcome

Interpersonal characteristics have been identified as significant predictors of good treatment outcome. In related studies, hostile-dominant interpersonal problems were associated with less symptomatic improvement by the end of therapy (Borkovec, Newman, Pincus, & Lytle, 2002; Gurtman, 1996; Ruiz et al., 2004), whereas affiliative impact messages were positively associated with outcome (Quilty et al., 2013). This is valuable information for purposes of treatment selection and patient allocation. However, for the practicing clinician it would be even more informative to know how in clients with specific mental disorders interpersonal changes are associated with symptomatic changes. Related findings may suggest interventions targeted at interpersonal change that may closely relate to symptomatic change. Also gaining more information on the relative importance of self-reports vs. informant reports on interpersonal factors may provide additional knowledge on the role of the clients' level of awareness of their interpersonal style. Potentially, informant reports by significant others provide information that may be missed by only attending to the clients' own reports of their interpersonal problems.

Several authors have formulated interpersonal theories of depression, according to which the disorder is maintained by a submissive and hostile-submissive interpersonal style and that it is central for depressed psychotherapy patients to become less submissive and/or more assertive in order to achieve (long-

term) symptomatic improvements (Coyne, 1976; Hames et al., 2013; Joiner, 2000; McCullough, 2003). In previous research, a decrease in therapist-perceived hostile-submissive impact messages was found to be related to a decrease in depressive symptoms (Constantino et al., 2012). If, however, the patients' significant others provided the IMI data, a decrease in depression was related to a decrease in submissiveness and in hostile-submissiveness as well as to an increase in dominance and friendly-dominance (Grosse Holtforth et al., 2012). Accordingly in the same study, increases in both IMI dimensional scores of dominance and affiliation were associated with decreases in depressive symptomatology. This differentiation suggests that patients' well-being significantly improves when they successfully generalize newly developed functional interpersonal patterns to contexts outside of the therapy sessions. The benefit of generalized interpersonal change may show particularly some time after the therapy has ended. Specifically, it should make a difference for the patient's long-term well-being, if a patient's significant others actually notice that the patient has changed also interpersonally (vs. only the patients him- or herself notices it). On the basis of these considerations, we hypothesize that (7), a pre-post decrease in IIP distress as well as increases in the IMI dimensions of dominance and affiliation predict a pre-post decrease of depressive and generic (non-specific) symptomatology. However, when it comes to symptom development after the termination of treatment, (8) pre-post increases in both IMI dimensions should be better predictors of the change in symptomatology from the end of therapy until the three months-follow-up than improvements in IIP-dimensions.

Methods

Participants

Patients. After obtaining approval from the local ethics committee, the patients were recruited in the context of a randomized controlled trial on psychotherapy for depression (Grosse Holtforth et al., resubmitted for publication) via local media and web-based advertisements. Of the 631 individuals initially screened for eligibility, 143 were included for treatment at the university-based psychotherapy outpatient clinic. A-priori inclusion criteria were meeting Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000) criteria for a Major Depressive Disorder (MDD), scoring at least 14 on the German version of the Beck Depression Inventory-II (Kühner, Bürger, Keller, & Hautzinger, 2007), and scoring no more than 13 points on the World Health Organization WHO-5 Well-Being Questionnaire (Henkel et al., 2004). Further inclusion criteria were being between the ages of 18 and 65 years, having sufficient mastery of written and spoken German, and giving informed consent to study participation. Exclusion criteria were meeting criteria for psychotic disorders (Schizophrenia, Schizophreniform, Schizoaffective, Psychosis NOS), Bipolar Disorder (current or lifetime), Borderline, Schizotypic or Antisocial Personality Disorder, current Substance Dependence, acute suicidality, mood disorders due to medical conditions, or the participation in concurrent psychological treatment. Patients who took antidepressant medication at a stable dose for at least one month were allowed to participate.

The patients' average age was $M = 40.6$ ($SD = 11.4$) years and 81 (56.6 %) were female. Fifty-seven (39.9 %) were single, 56 (39.2 %) were married or in a relationship, 22 (15.4 %) were separated, divorced, or widowed, while seven (4.9 %) did not provide information about their marital status. All 143 (100 %) were

Caucasian. The highest educational degree for 55 (38.5 %) was professional training, 24 (16.8 %) had finished high school, 56 (39.2 %) had a university degree, three (2.1 %) had less than 9 years of formal education, and 1 (0.7 %) did not provide educational data. Regarding diagnostic criteria, 103 (72 %) suffered from recurrent depressive episodes, whereas for 40 (38 %) the current episode was the first. Forty-three (30.1 %) of all patients were chronically depressed, that is the current episode lasted longer than two years or they had recurring episodes for over two years without full recovery between episodes. Fifty-eight patients (40.6 %) had at least one axis I comorbidity, among whom anxiety disorders were the most frequent (48 or 33.6 %). Thirty-three patients (23.1 %) had at least one comorbid (axis II) personality disorder, among whom 17 (11.9 %) had an obsessive-compulsive and 14 (9.8 %) had an avoidant personality disorder. All patients were diagnosed by trained interviewers administering the German version of the *Structured Clinical Interview for the DSM–IV Axis I and II Disorders* (Wittchen, Zaudig, & Fydrich, 1997). Interrater agreement (based on 22 % of our interviews) was $\kappa = .65$ for MDE (96.8 % agreement; one cell was equal to 1) and $\kappa = .80$ (92.9 %) for the course (single or recurrent episode) of the depression. More detailed information regarding recruitment and screening procedures, patient flow, and therapy assignment can be found elsewhere (Grosse Holtforth et al., resubmitted for publication).

Significant others. We recruited the significant by asking patients to identify an individual that knows them well and that they frequently interact with. Of the 133 significant others that finally provided IMI data, the mean age was $M = 43.2$ ($SD = 12.9$) years and 69 (51.9 %) were female. The nature of the relationship with the patients was as follows: 45 (33.8 %) spouses/partners, 40 (30.1 %) close friends,

seven (5.3 %) siblings, seven (5.3 %) children, six (4.5 %) mothers, one (0.8 %) father, one (0.8 %) divorced spouse, nine (6.8 %) other relationships, and 17 (12.8 %) did not report the nature of the relationship with the patient. The significant others were contacted via mail, and they were informed that patients would be kept blind about the IMI results at all time.

Therapists. A total of 24 therapists provided treatment in this study. Each therapist provided an equal amount of therapies in both conditions (maximum divergence was 1) and the average caseload per therapist was $M = 5.96$ ($SD = 2.66$; range = 1-13). The therapists' mean age was $M = 31.2$ ($SD = 5.2$) years and 21 (87.5 %) were female. During the trial, all therapists had weekly video-based small-group supervision meetings that were held by experienced senior clinicians.

Treatment protocol

The two treatment conditions delivered in the randomized controlled trial were both manualized psychotherapies. Details regarding treatment rationale and specific therapy tasks are reported elsewhere for Cognitive-Behavioral Therapy (Beck, Rush, Shaw, & Emery, 1979; Hautzinger, 2003) as well as for Exposure-based Cognitive Therapy for Depression (Grosse Holtforth et al., resubmitted for publication; Hayes, Beevers, Feldman, Laurenceau, & Perlman, 2005). In both treatment conditions, the treatment was conducted in three general phases: A first phase of strengthening the patient via activating resources and building individual skills, the second focusing on cognitive-emotional processing, and the third on consolidating and generalizing therapy gains. The treatments were limited to 22 sessions that were delivered over 26 weeks on average. Importantly, none of the treatments was designed to focus primarily on interpersonal functioning.

Measures

Inventory of Interpersonal Problems. The patients completed the German short version of the *Inventory of Interpersonal Problems-Circumplex Scale* (Thomas, Brähler, & Strauss, 2011) at pre-treatment and post-treatment. This self-report measure assesses specific interpersonal problems on 32 Likert-scaled items that range from 1 (*not at all*) to 4 (*absolutely*). Sample items are: “In order to get what I want, I influence other people too much.” (dominant), “It is hard for me to get along with other people” (hostile) From the resulting eight scales (PA, BC, (…), NO; arranged in counterclockwise order on the IPC), that adhere to circumplex characteristics, two dimensional scores for dominance and affiliation were calculated by combining the *z*-standardized octant scores by the following formulas (Locke, 2011): Dominance = 0.25(PA-HI+0.71(NO+BC-FG-JK)); Affiliation = 0.25(LM-DE+0.71(NO+JK -BC-FG)). Moreover, the mean score of all items was used to indicate the average level of interpersonal distress as the third factor of the instrument. The German IIP-32 has been validated and standardized using a representative sample ($N = 2115$) and has demonstrated comparable psychometric properties as the German 64-item and the original English versions (Horowitz, Alden, et al., 2000; Horowitz, Strauss, & Kordy, 2000). In the present sample, Cronbach’s α of the IIP-32 total score (general distress) was .83.

Impact Message Inventory. The German version of the *Impact Message Inventory* (IMI-RD; Caspar, 2002) was completed by the patients’ significant others pre-treatment and post-treatment. It is a translation of the 64-item octant version by Kiesler and Schmidt (2006) and assesses to what degree a target person (here: patient) evokes particular covert reaction (feelings, thoughts, action tendencies) in an

informant (here: significant other). Each item is rated on a 4-point Likert scale, ranging from 1 (*extremely inaccurate*) to 4 (*extremely accurate*) and sample items are: „When I am with this person, I get the feeling that he/she likes to assume responsibility" (dominant), "(…) I get the feeling of being appreciated by him/her." (friendly). The German version has been shown to have good psychometric properties and to adhere to circumplex structure (Grosse Holtforth et al., 2012). Therefore, we used the same formulas as with the IIP (see above) to compute dimensional scores of dominance and affiliation.

Symptomatic measures. To ensure the dependability of our results across perspectives and outcome variables, we administered two measures of depressive symptomatology (one self-report and one clinician-rated scale) and one self-report measure of general symptomatology at pre-treatment, post-treatment and three months after completion of treatment.

The German-language version of the revised *Beck Depression Inventory* (BDI-II; Hautzinger, Keller, & Kühner, 2006) was used to assess depressive symptomatology from the patient perspective. The instrument has previously been shown to have satisfactory internal consistency (α = .89 and .93) and test-retest reliability (r_{tt} = .78), good convergent and discriminant validity, as well as a good sensitivity to change (Kühner et al., 2007). In the current sample, Cronbach's α was .87.

The *Inventory of Depressive Symptomatology - Clinician Rated* 30-item version (Rush, Carmody, & Reimitz, 2000) was administered by trained raters to assess the depressive symptomatology from an external perspective. In previous studies, the internal consistency of the German IDS-C was found to be very good (α

= 0.93), the IDS-C scores correlated highly with BDI-II scores, and they discriminated well between depressive inpatients and outpatients (Drieling, Schärer, & Langosch, 2007).

To measure general psychiatric symptomatology, patients completed the German 9-item version of the self-report *Symptom Checklist* (SLC-9; Klaghofer & Brähler, 2001) which was constructed by taking from each of the nine SCL-90-R scales (Franke & Derogatis, 1995) the item showing the highest correlation with the Global Severity Index. The resulting 9-item scale has been shown to correlate with the GSI-90 at $r = .93$ and to have a good internal consistency (Klaghofer & Brähler, 2001). In the current sample, Cronbach's α was .77.

Process measure. The therapeutic alliance and cognitive-emotional processing were assessed after each session with a modified version of the *Bern Post-Session Report – Patient Form* (BPSR-P; Flückiger, Regli, Zwahlen, Hostettler, & Caspar, 2010), that previously had demonstrated a stable factor structure and good predictive validity. The therapeutic alliance scale had eight Likert-scaled items (sample items: "I feel that the therapist appreciates me"; "I believe the way we are working with my problem is correct."; "In today's session, we were working towards mutually agreed upon goals."; Cronbach's $\alpha = .84$). Cognitive-emotional processing was assessed by seven items (sample items: "In today's session, I was able to accept unpleasant feelings/experiences."; inverted: "In today's session, my feelings were not helpful."; Cronbach's $\alpha = .73$). The intercorrelation of the two process scales was $r = .55$.

Data-analytic strategy

To test the convergence of interpersonal problems and impact messages before therapy (hypothesis 1) as well as the convergence of IIP and IMI change over therapy (hypothesis 6), we calculated Pearson correlations between the IIP dominance, affiliation, and distress scores on the one hand and IMI dominance and affiliation scores on the other hand. To test for moderators of the associations in hypothesis 1, we calculated separate Pearson correlations for each sub-group according to the potential moderator and then tested the differences between the correlations by using an *r*-to-*z*-transformation. In order to test for change in interpersonal variables over therapy (hypotheses 4 and 5) we calculated repeated measures *t*-tests with pre and post scores of all five above-mentioned interpersonal variables. All above-mentioned analyses were executed with SPSS 21 and with the maximum number of cases available for each instrument (see Table 1).

To predict psychotherapy process from the interpersonal variables (hypotheses 2 and 3), we regressed the pre-scores of the five interpersonal variables on the patient-rated early therapeutic alliance (mean scores of the alliance scale over the first 5 sessions) and on patient-rated cognitive-emotional processing (averaged over all sessions). To predict short- and long-term outcome (hypotheses 7 and 8), we regressed standardized residual change scores of the five interpersonal variables first on pre to post (short-term) standardized residual change scores of the three symptomatic measures (BDI-II, IDS-C, SCL-9) and then on post to follow-up (long-term) residual change scores of the same measures. For all regression models, it was important to take the therapists as a potential source of variance into account because patients (level 1) were nested within therapists (level 2). Thus, to test the need for multilevel modeling, it was necessary to check if the factor “therapist”

explained variance in any of the dependent variables. The ICC's for the process variables were as follows: early therapeutic alliance ICC(1)=0.02, $F(23, 116)=1.10$, $p=.358$, cognitive-emotional processing ICC(1)=0.09, $F(23, 116)=1.59$, $p=.059$. The ICC's for the change in symptomatic variables were as follows: pre-post BDI-II change ICC(1)=-0.04, $F(23, 98)=0.79$, $p=.729$, pre-post IDS change ICC(1)=0.10, $F(23, 100)$, $p=.059$, pre-post SCL9 change ICC(1)=0.08, $F(23, 96)=1.41$, $p=.127$, post-follow-up BDI-II change ICC(1)=0.07, $F(23, 84)=1.34$, $p=.169$, post-follow-up IDS-C change ICC(1)<0.01, $F(23, 92)=1.02$, $p=.45$, post-follow-up SCL-9 change ICC(1)=0.13, $F(23, 83)=1.69$, $p=.044$. Because these values attain significance for one variable and are marginally significant for two more variables, we decided to follow a conservative data-analytic strategy and considered it most adequate to calculate multilevel models for all regression models. First, we calculated separate regression models for each interpersonal predictor and then, in a final analysis, entered all five interpersonal predictors simultaneously to check for incremental predictive power. For this, we used the multilevel package of the open-source statistical software environment R (R-Core-Team, 2012).

Results

Associations of Interpersonal Problems with Impact Messages (Hypothesis 1)

While Table 1 provides the descriptive statistics of the interpersonal variables, Table 2 shows the associations between the corresponding IIP and IMI dimensions. The two instruments correlated moderately and significantly on the dominance axis ($r = .36$; $p < .001$), whereas on the affiliation dimension they were not significantly associated ($r = .11$; $p = .214$). None of the potential moderator variables (chronicity, level of depressive symptoms, sex, type of significant other's relationship towards

patient) was significant (all *p*s > .20). Although not predicted, IIP distress was negatively associated with IIP dominance (r = -.21; p = .013) and IMI dominance was positively associated with IMI affiliation (r = .22; p = .012).

Prediction of Psychotherapy Process (Hypotheses 2 and 3)

Testing the hypotheses that IIP and IMI affiliation positively predict the quality of the early alliance and the mean level of cognitive-emotional processing over the whole therapy, Table 3 shows that, if the interpersonal variables were entered separately into the multilevel models, only IIP affiliation significantly predicts both process variables, whereas the coefficients for IMI affiliation fail to attain significance. If all interpersonal variables were entered into the same multilevel model simultaneously to check for concurrent predictive validity, then IIP affiliation remained a significant predictor of cognitive-emotional processing (Coeff. = 0.118; SE = 0.051; t [126] = 2.317; p = .022), whereas the prediction of the early alliance by IIP affiliation emerged as a statistically insignificant trend (Coeff. = 0.089; SE = 0.047; t [126]= 1.894; p = .061). None of the other interpersonal variables predicted either of the process variables.

Change of Interpersonal Problems and Impact Messages over Therapy (Hypotheses 4-6)

Table 1 shows how the interpersonal variables changed over the course of the psychotherapeutic treatment: IIP distress significantly decreased, whereas IIP affiliation significantly increased. The increase of IIP dominance emerged as a statistically insignificant trend. For the IMI the results were as follows: dominance increased significantly, whereas affiliation remained constant.

When we correlated the standardized residual change scores of all interpersonal variables (see Table 4), none of the corresponding IIP and IMI dimensions correlated significantly (both *p*'s > .30). Although unanticipated, change in IMI dominance correlated significantly with change in IMI affiliation ($r = .21$; $p = .029$).

Prediction of Psychotherapy Outcome (Hypotheses 7 and 8)

Testing the separate predictive power of the change in interpersonal variables, the results of the multilevel models in Table 5 show that pre-post change in IIP distress consistently predicted pre-post change in all three outcome measures (BDI-II, IDS-C, and SCL-9), and change in IMI dominance negatively predicted change in the BDI-II and the IDS-C, whereas it fell short of attaining significance in predicting the SCL-9. If all interpersonal variables were entered into the multilevel model simultaneously, then only pre-post residual change scores of IIP distress consistently predicted pre-post residual change scores of BDI-II (Coeff. = 0.323; $SE = 0.095$; $t[100] = 3.396$; $p = .001$), IDS-C (Coeff. = 0.303; $SE = 0.096$; $t[100] = 3.172$; $p = .002$), and SCL 9 (Coeff. = 0.240; $SE = 0.104$; $t[98] = 2.306$; $p = .023$), whereas IMI dominance was not a significant predictor anymore.

Table 6 shows us the separate predictive power of the change in interpersonal variables regarding long-term outcome: The pre-post change in the IMI dominance dimension consistently predicted the change in all three outcome measures from post to the three-month follow-up. In addition, change in IIP distress predicted long-term general symptomatology as measured by the SCL-9. If all interpersonal variables were entered into the multilevel models simultaneously, then IMI dominance predicted residual change scores from post to follow-up of the BDI-II

(Coeff. = -0.256; *SE* = 0.102; *t*[89] = -2.516; *p* = .014), and of the SCL-9 (Coeff. = -0.287; *SE* = 0.093; *t*[88] = -3.090; *p* = .003), and attained a marginally significant trend in the case of the IDS-C (Coeff. = -0.193; *SE* = 0.103; *t*[96] = -1.865; *p* = .065), whereas none of the other interpersonal variables were significant.

Discussion

In the current investigation, we sought to further elucidate how self-reported interpersonal problems of depressive psychotherapy patients and impact messages as perceived by their significant others are related to each other, change over treatment, and predict psychotherapy process and outcome.

Associations of Interpersonal Problems with Impact Messages

Partly confirming our first hypothesis, the respective dominance axes of IIP and IMI were positively associated, but the affiliation axes were unrelated. Of course, divergence between the two instruments can partly be ascribed to differing interpersonal constructs being assessed (interpersonal problems vs. interpersonal style) as well as differing response formats. However, IIP and IMI both meet interpersonal circumplex criteria and use standardized axis scores. On the basis of this theoretical common ground, the above-mentioned differential findings can also be attributed to differing perspectives of the respondents. Indeed, this result corroborates the earlier finding that depressive patients' own view on their friendliness has little to do with how friendly they are perceived by others (Quilty et al., 2013). Moreover, it points towards the importance of carefully choosing the source of information on patients' interpersonal characteristics: The therapist's own impression of his or her patient's level of dominance might not converge with how dominant the patient sees him- or herself (Quilty et al., 2013), whereas our findings

suggest at least a moderate agreement between patients and their significant others regarding the patients' dominance/submissiveness. This divergence between various sources of information might be explained by the fact that therapists – in stark contrast to the significant others – construct their views based on a limited number of interactions in well-defined situations with pre-ascribed roles, limiting the range of potential patient behaviors and thus biasing the therapists' impressions.

Prediction of Psychotherapy Process

Furthermore, we hypothesized that self-reported and other-reported friendliness would predict the therapeutic process as assessed by post-session reports. We found that both, the early therapeutic alliance and cognitive-emotional processing (averaged over the whole therapy) were predicted by IIP affiliation but not by IMI affiliation, thus lending partial support to hypotheses 2 and 3. Testing the concurrent predictive validity of all interpersonal variables, self-perceived IIP affiliation emerged as a particularly good predictor of cognitive-emotional processing and as a marginally significant predictor of the alliance. These results extend earlier findings (Connolly Gibbons et al., 2003; Dinger et al., 2009) and suggest that it is not only to the best advantage of the early therapeutic relationship if a depressed patient sees him- or herself as warm and agreeable when entering a psychotherapy, but that this self-representation also relates to his or her levels of emotional arousal and emotional insight across the course of therapy. As previous results suggest, patient unfriendliness is likely to result in hostility impasses that potentially impede a constructive therapeutic process (Altenstein et al., 2013). The result that friendly impact messages as perceived by the patients' significant others do not predict the therapeutic process, points to the possibility that a therapist's and a significant

other's report on impact messages received from the same person (the client) fundamentally differ, and that the significant others' reports are not as indicative of what happens during the sessions as is the therapist's view (Constantino et al., 2010). The professional role of the informant (therapist) combined with the specific relational context (in therapy) may allow for more valid predictions of important therapy processes.

Change of Interpersonal Problems and Impact Messages over Therapy

Partly supporting hypothesis 4, IIP distress decreased significantly over the course of psychotherapy, but IIP affiliation increased significantly and IIP dominance increased with marginal significance. This contrasts earlier null findings regarding the change in single IIP dimensions (Quilty et al., 2013; Renner et al., 2012; Vittengl et al., 2003). One possible explanation is that the treatment in the three previous studies was shorter, i.e. 20 sessions over 13 weeks (Vittengl et al., 2003), 16-20 sessions over 12-14 weeks (Renner et al., 2012), and 17 weekly sessions respectively (Quilty et al., 2013), than in our study, i. e. 22 sessions over 26 weeks. This is in line with theories that conceptualize interpersonal change as second-order change which in most cases requires more time than first-order (or symptomatic) change (Watzlawick, Weakland, & Fisch, 1974).

The most pronounced change over the course of therapy, however, occurs on the IMI dominance dimension: After psychotherapy the patients are perceived as considerably more assertive and self-assured (d = 1.06), whereas the significant others' view on the patients' affiliation remains constant. This result is partly consistent with hypothesis 5. As a logical consequence, and confirming hypothesis 6, the residual change scores of the corresponding IIP and IMI dimensions of

dominance and affiliation are not related to each other. This predicted null finding suggests that the perspectives of the patients themselves and their significant others are by no means redundant, but provide researchers and practitioners with valuable additional information.

Prediction of Psychotherapy Outcome

Finally, we sought to investigate the central question of how the change in interpersonal variables predict therapy outcome and differentiated between short-term outcome, i.e. change in symptomatology from pre to post, and long-term outcome, i.e. change in symptomatology from post to the follow-up 3 months later. As for short-term outcome, partly consistent with our hypothesis 7, IIP distress predicted the change in all three symptom measures above and beyond all other interpersonal variables. Neither the change in IIP nor IMI dimensions predicted simultaneous change in symptomatology. One possible explanation of this result, as argued above, could be that overall IIP distress is not genuinely interpersonal but merely represents a general factor indicating the level of suffering or impaired functioning (Grosse Holtforth et al., 2006).

More notable, however, is the prediction of long-term outcome: Partly confirming hypothesis 8, the pre-post change in the IMI dominance dimension outperforms all other interpersonal variables in predicting symptomatology subsequent to therapy termination. This result is consistent across self-reported depressive (BDI-II) as well as generic (SCL-9) symptomatology and reaches marginal significance for clinician-reported depressive symptomatology (IDS-C). Although in need of replication, this result suggests that, in order to sustainably alleviate psychological suffering, it is crucial for depressive patients to also improve

regarding their levels of activity, assertiveness and self-confidence in social interactions. In contrast, it might be irrelevant whether they become more agreeable, sociable or friendly. Moreover, it seems to be insufficient that the patients themselves perceive a change in their interpersonal behaviors. Rather, our results suggest that it is decisive whether these changes can be perceived and reacted to by the patients' significant others in daily life. In other words: Knowing your own interpersonal inadequacies alone may not suffice to help you recover from depression, but rather actually behaving differently with others, so that they perceive you differently. Eliciting certain affective and cognitive reactions as well as action tendencies from others, i.e. impact messages, in the context of developing a more dominant and less submissive interpersonal style with the help of psychotherapy can indeed be considered a second-order change sensu Watzlawick et al. (1974), in the way that it alters the fundamental structure of the interpersonal system around the patient and thus feeds back on how the client experiences the world.

Limitations

Besides the strengths of the present study such as the integration of different perspectives with regard to interpersonal as well as symptomatic variables and the inclusion of a follow-up, our study also has several limitations: First, as much as it is an asset to investigate a potential mechanism of change in patients with a specific psychological disorder, our homogeneous sample of Caucasian patients with major depression precludes generalization to patients with other diagnoses or from other ethnicities. Second, we based our analysis on the assumption that patients with MDD generally have relatively similar interpersonal characteristics. Although there is evidence that the majority of depressive patients exhibit a submissive interpersonal

style, it is possible to empirically distinguish sub-groups based on their interpersonal characteristics (Grosse Holtforth et al., 2012; Grosse Holtforth et al., 2014). Since our sample size impeded analyses on the sub-group level, future studies will need to differentiate what kind of interpersonal change is most productive for patients with a particular interpersonal style. Moreover, replication with a larger sample size might differentiate our results regarding potential moderators. Third, the process variables were assessed by patient self-report measures after the sessions, and therefore our prediction of the therapeutic process could be interpreted as a methodological artifact in the sense that patients who consider themselves more friendly are also more likely to evaluate the therapeutic process in a more friendly and positive light. For future research it will be necessary to investigate the relationship between interpersonal patient characteristics and observer-based ratings of the alliance and cognitive-emotional processing.

Therapeutic Implications

To sum up, our findings have the following implications for the treatment of patients with major depression: Given the divergence of IIP and IMI ratings, practitioners are well-advised to not exclusively rely on the patients' own view of their interpersonal style. Rather, they should integrate the patients' significant others in the diagnostic process and during the course of the therapy and thus retrieve valuable information about their patients' interpersonal style. This should not only be done at the beginning of treatment but also towards the end. This strategy promises to support making maximally informed decisions regarding the timing of termination also considering whether the patient managed to translate his new, more functional interactional patterns into his daily social life. Moreover, our study reconfirms the

notion that becoming more dominant and less submissive might be a potential mechanism of change in depression therapy, even if the specific treatment does not aim at changing the patients' interpersonal style. In our view, our findings provide a strong empirical argument for integrating the interpersonal perspective in any treatment approach for depression (Follette & Greenberg, 2006). If change in interpersonal functioning is not treated as a mere by-product of therapy but is explicitly targeted as a crucial mechanism of change, such an augmented therapeutic approach will most likely result in enhanced therapeutic success and promises to increase the sustainability of symptomatic improvement.

Conclusion

The results of the present study show that the assessment of interpersonal style from different perspectives is not redundant. Self-reported affiliation at pretreatment seems to be especially important with regard to therapeutic process, whereas a decrease in self-reported overall interpersonal distress and an increase in other-reported dominance predict symptom improvement at post and at follow-up, respectively.

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Table 1

Descriptives and change of Interpersonal Problems and Impact Messages Before and After Therapy

	Pre	Post	Pre-Post Change					
	M (*SD*)	*M* (*SD*)	*t*	*df*	*p*	*d* [a]	*CI LL*	*CI UL*
IIP Dominance	-0.41 (0.73)	-0.36 (0.60)	-1.78	119	.078	0.07	-0.17	0.32
IIP Affiliation	-0.14 (0.75)	-0.01 (0.61)	-3.51	118	.001	0.19	-0.05	0.43
IIP Distress	1.73 (0.45)	1.58 (0.50)	4.03	120	<.001	-0.32	-0.56	-0.07
IMI Dominance	-0.76 (0.89)	0.12 (0.76)	-4.10	110	<.001	1.06	0.79	1.32
IMI Affiliation	-0.14 (0.75)	-0.10 (0.65)	-0.65	109	.515	0.06	-0.19	0.31

Note. Sample sizes: IIP pre $n = 143$, IIP post $n = 121$, IMI pre $n = 133$, IMI post $n = 115$; all error probabilities are two-tailed; [a] Cohen's *d* was calculated with pooled standard deviations; IIP = Inventory of Interpersonal Problems; IMI = Impact Message Inventory; *CI LL* = 95 % confidence interval lower limit; *CI UL* = 95 % confidence interval upper limit.

Table 2

Correlations of Interpersonal and Symptomatic Variables Before Therapy

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) IIP Dominance	-						
n							
(2) IIP Affiliation	.00	-					
n	(143)						
(3) IIP Distress	-.21*	.12	-				
n	(143)	(143)					
(4) IMI Dominance	.36**	.01	.03	-			
n	(132)	(132)	(132)				
(5) IMI Affiliation	-.08	.11	-.04	.22*	-		
n	(132)	(132)	(132)	(132)			
(6) BDI-II	-.15	.01	.21*	-.23**	-.11	-	
n	(143)	(143)	(143)	(132)	(132)		
(7) IDS-C	-.02	-.02	.11	-.11	-.11	.81**	-
n	(143)	(143)	(143)	(132)	(132)	(143)	
(8) SLC-9	-.08	.01	.30	-.04	.03	.57**	.62**
n	(142)	(142)	(142)	(131)	(131)	(142)	(142)

Note. All correlations are Pearson's *r*. IIP = Inventory of Interpersonal Problems; IMI = Impact Message Inventory; BDI-II = Beck Depression Inventory; IDS-C = Inventory of Depressive Symptomatology – Clinician Rating; SCL-9 = Symptom Checklist – 9 item short version.

*$p < .05$; **$p < .01$, two-tailed.

Table 3

Multilevel Models Predicting the Early Therapeutic Alliance and Cognitive-emotional Processing from Pre-scores of Interpersonal Variables

Variable	Early Therapeutic Alliance				Cognitive-emotional Processing			
	Coeff.	*SE*	*t* (*df*)	*p*	Coeff.	*SE*	*t* (*df*)	*p*
IIP Dominance	0.033	0.045	0.741 (138)	.460	0.042	0.048	0.863 (138)	.390
IIP Affiliation	**0.110**	**0.044**	**2.522 (138)**	**.013**	**0.127**	**0.047**	**2.712 (138)**	**.008**
IIP Distress	-0.079	0.075	-1.064 (138)	.289	-0.056	0.081	-0.695 (138)	.489
IMI Dominance	0.037	0.038	0.990 (130)	.324	0.031	0.041	0.745 (130)	.457
IMI Affiliation	0.071	0.045	1.584 (130)	.116	0.076	0.049	1.556 (130)	.122

Note. Significant predictions are in boldface type; all error probabilities are two-tailed; Degrees of freedom vary because the amount of missing data differs among measures; IIP = Inventory of Interpersonal Problems; IMI = Impact Message Inventory.

Table 4

Correlations of Pre-Post Change in Interpersonal and Symptomatic Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) ResC IIP Dominance	-						
n							
(2) ResC IIP Affiliation	.06	-					
n	(119)						
(3) ResC IIP Distress	-.17	-.09	-				
n	(120)	(119)					
(4) ResC IMI Dominance	.08	.00	-.16	-			
n	(107)	(106)	(108)				
(5) ResC IMI Affiliation	-.06	.10	.08	.21*	-		
n	(107)	(108)	(110)	(110)			
(6) ResC BDI-II	.06	-.03	.32**	-.23*	-.11	-	
n	(120)	(119)	(121)	(109)	(109)		
(7) ResC IDS-C	-.05	-.09	.34**	-.20*	-.07	.68**	-
n	(120)	(119)	(121)	(111)	(109)	(122)	
(8) ResC SCL-9	.026	-.02	.27**	-.16	-.06	.77**	.53**
n	(118)	(117)	(119)	(107)	(107)	(120)	(120)

Note. All correlations are Pearson's *r*. ResC = standardized residual change score; IIP = Inventory of Interpersonal Problems; IMI = Impact Message Inventory; BDI-II = Beck Depression Inventory; IDS-C = Inventory of Depressive Symptomatology – Clinician Rating; SCL-9 = Symptom Checklist – 9 item short version.

*$p < .05$; **$p < .01$, two-tailed.

Table 5

Multilevel Models Predicting Pre-post (Short-term) Symptomatic Change from Pre-post Change in Interpersonal Variables

Variable	BDI-II pre – post ResC				IDS-C pre – post ResC				SCL 9 pre – post ResC			
	Coeff.	*SE*	*t* (*df*)	*p*	Coeff.	*SE*	*t* (*df*)	*p*	Coeff.	*SE*	*t* (*df*)	*p*
IIP Dominance pre-post ResC	0.060	0.092	0.644 (118)	.521	-0.051	0.092	-0.549 (118)	.584	0.026	0.093	0.285 (116)	.776
IIP Affiliation pre-post ResC	-0.025	0.093	-0.271 (117)	.787	-0.086	0.092	-0.934 (117)	.352	-0.021	0.096	-0.222 (115)	.824
IIP Distress pre-post ResC	**0.324**	**0.087**	**3.728 (119)**	**<.001**	**0.334**	**0.086**	**3.872 (119)**	**<.001**	**0.264**	**0.089**	**2.970 (117)**	**.004**
IMI Dominance pre-post ResC	**-0.225**	**0.092**	**-2.437 (107)**	**.016**	**-0.192**	**0.091**	**-2.098 (109)**	**.038**	-0.162	0.097	-1.674 (105)	.097
IMI Affiliation pre-post ResC	-0.104	0.095	-1.096 (107)	.276	-0.064	0.094	-0.679 (108)	.498	-0.058	0.099	-0.591 (105)	.556

Note. Significant predictions are in boldface type; all error probabilities are two-tailed; Degrees of freedom vary because the amount of missing data differs among measures; ResC = standardized residual change; BDI-II = Beck Depression Inventory; IDS-C = Inventory of Depressive Symptomatology – Clinician Rating; SCL-9 = Symptom Checklist – 9 item short version; IIP = Inventory of Interpersonal Problems; IMI = Impact Message Inventory.

Table 6

Multilevel Models Predicting Post-follow-up (Long-term) Symptomatic Change from Pre-post Change in Interpersonal Variables

Variable	BDI-II post – follow-up ResC				IDS-C post – follow-up ResC				SCL-9 post – follow-up ResC			
	Coeff.	*SE*	*t* (*df*)	*p*	Coeff.	*SE*	*t* (*df*)	*p*	Coeff.	*SE*	*t* (*df*)	*p*
IIP Dominance pre-post ResC	0.094	0.096	0.978 (104)	.330	0.064	0.096	0.663 (112)	.508	0.090	0.097	0.935 (103)	.352
IIP Affiliation pre-post ResC	0.052	0.096	0.541 (103)	.589	0.032	0.095	0.338 (111)	.736	0.020	0.098	0.201 (102)	.841
IIP Distress pre-post ResC	0.076	0.099	0.768 (105)	.444	0.129	0.095	1.355 (113)	.178	**0.195**	**0.097**	**2.003 (104)**	**.048**
IMI Dominance pre-post ResC	**-0.254**	**0.095**	**-2.663 (96)**	**.009**	**-0.203**	**0.098**	**-2.077 (103)**	**.040**	**-0.290**	**0.089**	**-3.237 (95)**	**.002**
IMI Affiliation pre-post ResC	-0.027	0.106	-0.258 (96)	.797	0.022	0.102	0.215 (103)	.830	0.004	0.101	0.036 (95)	.971

Note. Significant predictions are in boldface type; all error probabilities are two-tailed; Degrees of freedom vary because the amount of missing data differs among measures; ResC = standardized residual change; BDI-II = Beck Depression Inventory; IDS-C = Inventory of Depressive Symptomatology – Clinician Rating; SCL-9 = Symptom Checklist – 9 item short version; IIP = Inventory of Interpersonal Problems; IMI = Impact Message Inventory.

2.3 Study 3: Interpersonal Micro-Processes Predict Cognitive-Emotional Processing and the Therapeutic Alliance in Psychotherapy for Depression

David Altenstein, Tobias Krieger, Martin Grosse Holtforth

University of Zurich, University of Zurich, University of Zurich and University of Bern

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Abstract

Interpersonal theories of psychotherapy hypothesize that the success of therapy depends on the therapist's and patient's dominant and affiliative behaviors as well as their interplay (complementarity). This study sought to investigate (1) how in-session interpersonal micro-processes predict post-session evaluations of the therapeutic alliance as well as cognitive-emotional processing, and (2) how complementarity develops over the course of a therapy session. Twenty depressed patients were treated at a university-based outpatient clinic with a variant of Cognitive Therapy. One session was analyzed from each therapy's middle phase using a novel real-time rating procedure (joystick method) to assess the patients' and therapists' affiliative and dominant behaviors as well as their resulting complementarity over the course of the session. The therapeutic alliance and cognitive-emotional processing was assessed by self-reports directly after the respective session. As predicted, more emotional arousal was associated with deviations from complementarity, whereas a positive alliance was related to affiliative patient behavior. Moreover, marginally significant trends suggest that refraining from answering to the pull of patient hostility might benefit both the alliance as well as cognitive-emotional processing. Overall, multilevel growth modeling revealed a significant cubic trend of complementarity over the course of the session. Implications for future research and practice are discussed.

A long-standing tradition of psychotherapy process-outcome research has sought to identify the mechanisms of change in psychotherapy (Orlinsky, Ronnestad, & Willutzki, 2004), and has produced a body of literature reflecting varying theoretical approaches and great methodological richness. Two variables are most strongly and consistently related to treatment success: On the one hand, the most recent in a series on meta-analyses on the subject (Horvath, Del Re, Flückiger, & Symonds, 2011), aggregating the results of 190 studies, finds that the therapeutic alliance is associated with outcome at $r = .275$, irrespective of therapeutic approach, assessment method, or rating perspective. The therapeutic alliance has been explicated pantheoretically to encompass the following constructs: an affective bond between patient and therapist, the client's motivation and ability to accomplish work collaboratively, the therapist's empathic responding to and involvement with the client, as well as client and therapist agreement about the goals and tasks of therapy (Horvath, 2001; Wampold, 2001). On the other hand, corroborating the findings of two earlier reviews (Greenberg & Pascual-Leone, 2006; Whelton, 2004), a recent meta-analysis (Pascual-Leone & Yeryomenko, 2012) that was based on 11 data sources finds that client *experiencing* correlates with outcome at r=.236. This construct comprises two distinct but interrelated psychological processes (Klein, Mathieu-Coughlan, & Kiesler, 1986): *Emotional arousal* in the session as well as *cognitive clarification experiences* (Grawe, 2007) through which the patient acquires a better understanding of him or herself as a person and/or of his or her problems. For the sake of a pantheoretical terminology, this two-fold process is henceforth referred to as *cognitive-emotional processing*. The majority of previous process-outcome studies that investigate the alliance and cognitive-emotional processing have used self-report questionnaires assessing the therapeutic process

retrospectively as remembered by the patient or the therapist after the session (Orlinsky et al., 2004). However, to make theoretically sound and empirically-based recommendations on how therapists may promote these crucial variables, we need studies that analyze the fine-grained interpersonal processes in the sessions and relate them to post-session reports of the alliance and cognitive-emotional processing. This is the aim of our study.

A model for the assessment of interpersonal processes widely used in psychology is the interpersonal circumplex model (Horowitz & Strack, 2011). First proposed by Leary (1957), the interpersonal circumplex (IPC) is defined by two orthogonal axes: A horizontal axis of *affiliation* (also: solidarity, friendliness, warmth, love, or communion) with its poles friendly and hostile, as well as a vertical axis of *dominance* (also: power, control, or agency) with its poles dominant and submissive. Each point within the IPC can be defined by a combination of the values on these two variables (x- and y-axes) and the resulting localization in a two-dimensional space. Thus, by locating the behavior of two interactants at any moment of their interaction this model enables researchers to test hypotheses regarding mutual influences and trace the unfolding of the interaction, independent of the content being delivered. A particular form of mutual interpersonal influence is the construct of *interpersonal complementarity*. Generally perceived as an indicator of harmony or smoothness of an interaction, Carson (1969) proposed the first definition of interpersonal complementarity based on the IPC. According to Carson, complementarity is characterized by similar behaviors on the affiliation axis (*correspondence*), as well as oppositeness of the interactants' behaviors on the dominance axis (*reciprocity*). Accordingly, friendly behavior invites friendly behavior and hostile behavior pulls for

hostile behavior, whereas dominant behavior is answered by submissive behavior and vice versa.

Previous studies that tried to identify helpful therapeutic interactions using the interpersonal circumplex model mainly tested associations of affiliation, dominance and complementarity with the success of the entire therapy. As reviewed by Tracey (2002), the literature lends partial support to the hypothesis that a high-low-high pattern of complementarity over the course of therapy is associated with outcome. One of the most thorough empirical studies testing the validity of this model (Tracey, Sherry, & Albright, 1999) finds that it is generally beneficial if, in the middle phase of treatment, a productive interpersonal conflict (drop of complementarity) occurs, but leaves open the question how the therapist should behave in the face of patient hostile behavior. A more recent study (Von Der Lippe, Monsen, Ronnestad, & Eilertsen, 2008) using the Structural Analysis of Social Behavior (SASB; Benjamin & Cushing, 2000) as an observational tool for interpersonal processes found that unsuccessful therapies were characterized by therapists more frequently going along with the interpersonal pull of patient hostility. However, SASB uses a different operationalization of the IPC than the previous study, and in this study, unexpected sections of the circumplex model were omitted (e. g. attack, love). Consequently, these results call for a replication using a methodology that adheres more closely to the original IPC (Leary, 1957). As argued above, the ambiguous results might be resolved by a study that not only tests for the relatively remote link between in-session behaviors and global therapy success but for the more direct associations between the behavioral interchanges and sessions reports of the alliance and cognitive-emotional processing. The need of empirically-based recommendations how therapists should react to patient hostility appears particularly relevant in the

light of Tracey's (1993) assumption that this might be the most important link to outcome.

Importantly, it has been argued (Tracey, 2002; Tracey et al., 1999) that the strength of the association between complementarity and outcome depends on the way that complementarity is operationalized. Recent results in basic psychological research (Sadler, Ethier, Gunn, Duong, & Woody, 2009; Tracey, 2004) show that, instead of assessing complementarity over whole therapy sessions (e.g., Kiesler, 1984; Tracey & Schneider, 1995), or sequentially (e. g. Strong, Hills, & Nelson, 1988) interpersonal complementarity can also be conceptualized as a highly simultaneous process that can be operationalized by tracking subtle changes in the interactants' behavior in real-time over the entire course of an interaction. Consequently, we chose a novel real-time joystick technique (Sadler et al., 2009) as our observational instrument. Two studies applied the joystick technique in a non-clinical sample (Markey, Lowmaster, & Eichler, 2010; Sadler et al., 2009), and one study used this technique in a therapeutic context to investigate whether parallel processes occur in supervision and therapy (Tracey, Bludworth, & Glidden-Tracey, 2012), thus providing further support of the applicability of this method.

Research Questions and Hypotheses

Based on previous research as reviewed by Tracey (2002), we expect that (1) the interaction between therapists and patients during the sessions in the middle phase of treatment is characterized by a moderate degree of complementarity. Following Sadler et al. (2009), we expect a positive correlation of moment-to-moment ratings of patients' and therapists' affiliation (correspondence) as well as a negative correlation of patients' and therapists' behaviors on the dominance axis (reciprocity).

With regard to the therapeutic alliance we test the following hypotheses: By definition, the therapeutic alliance should be perceived as good and intact when both therapist and patient behave toward each other in a warm and agreeable manner. Therefore, we expect that (2) the more patient and therapist interact in a friendly manner in the session, the better the alliance will be perceived by the patient after the session. However, as a function of personality traits or situational disagreements it is likely that patients occasionally display hostile behaviors. Based on the previous findings mentioned above (Von Der Lippe et al., 2008), we assume that (3) whenever the patient behaves in a hostile way during the session, it will be the more beneficial for the alliance the more the therapist deviates from correspondence. However, if the therapist answers to the "pull" of hostility, such behavior should be associated with lower alliance ratings (even if this happens only once). Consequently, we expect that, in the face of patient hostility, (4) the smaller the minimal degree of therapist affiliation the worse the evaluation of the alliance.

With regard to cognitive-emotional processing a different set of interpersonal patterns can be assumed to predict the patient's session evaluation. Interpersonal theory (Kiesler, 1996) views the phenomenon of complementarity as a means to minimize insecurity and thus emotional arousal in an interaction. However, investigations of the three-stage model of psychotherapy (Tracey, 2002) found that in the middle phase of treatment change is more likely to occur if the therapist deviates from complementarity and thus induces an interpersonal conflict over how the relationship is to be enacted. As a consequence, we expect that (5) the more the interaction deviates from complementarity, the more emotionally aroused the patient will be. It is less clear, however, which interpersonal processes can be expected to promote the clarification element of cognitive-emotional processing. Building on

therapeutic recommendations from experts in the treatment of chronically depressed patients (McCullough, 2000), the therapist's reaction to patient hostility seems to play a critical role. It is argued that, when the therapy gets stuck in a *hostility impasse*, the content of what is discussed is marginalized and it is impossible to acquire meaningful insights. Accordingly, we hypothesize that (6) the more the interaction deviates from correspondence in the face of patient hostility, the more clarification experiences the patient will report.

As our study is the first to investigate the temporal patterns of complementarity within single therapy sessions, assumptions of systems theory regarding hierarchical nested systems may help to formulate testable expectations. Systems theory (Auger, 1989) postulates that all systems (ecosystems, human beings etc.) consist of heterogeneous (nested) interconnected entities. These entities may be assumed to have, although on different hierarchical levels, similar characteristics and to adhere to similar dynamics of change. This general idea has already been translated into and successfully applied in the psychotherapy context (e.g. Salvatore & Tschacher, 2012; Schiepek & Strunk, 2010). Thus, we conceptualize one therapy session as a "small therapy nested within a whole therapy". Accordingly, we expect (7) to find the same high-low-high progression of complementarity over the course of one session as has been hypothesized over the three stages of an entire therapy (Tracey, 1993, 2002). Previous findings (Gassmann & Grawe, 2006) support the idea of an in-session high-low-high pattern of interpersonal harmony. The graphic representation of the model as depicted in several articles (Tracey, 2002; Tracey et al., 1999) suggests a cubic pattern with an initial increase of complementarity ("warm-up phase") before a U-shape. Therefore, we will test for a quadratic as well as a cubic model and expect a better model fit for the cubic model.

Method

Participants

Patients. The sample of the current study was recruited for a pilot trial of Exposure-Based-Cognitive Therapy for Depression at a university-based outpatient clinic serving the community in Switzerland (Grosse Holtforth et al., 2012). All patients signed informed consent forms before the initial intake interview and were administered the Structured Clinical Interview for DSM-IV (Wittchen, Zaudig, & Fydrich, 1997) to assess axis I disorders. Inclusion criteria were a current major depressive episode and age of 18–65 years. Exclusion criteria were the following: psychotic, bipolar, post-traumatic stress, obsessive-compulsive disorder, borderline personality, substance dependence, and acute suicidal thoughts. Previously stable antidepressant medication was permitted.

This paper is based on *N*=20 patients that completed 20 sessions of treatment. Except for one Asian patient, all patients (95%) were Caucasian, 12 patients (60%) were female, and the mean age of patients was 32.67 years (*SD* = 9.56; range = 21-52). Eleven patients (55%) were single, 4 (20%) were divorced, and 2 (20%) married. For 7 patients (35%), the highest educational degree was at least “high school diploma” (completed 12th grade) or higher. Five patients (25%) had a single depressive episode, 15 (75%) suffered from recurrent episodes. Among the 8 patients (40%) with comorbidities, the most prevalent were anxiety disorders (n=6; 30%) and substance abuse (n=3; 15%). Seven patients (35%) took antidepressant medication.

Therapists. The 12 therapists had a mean age of 36.34 years (*SD* = 6.31; range = 30-47) and 8 (67%) were female. The caseload per therapist ranged from 1 to 7. Six (50 %) were experienced staff members and 6 (50 %) were advanced

masters-level therapists in postgraduate psychotherapy training. All therapists had previous postgraduate training in cognitive-behavioral and process-experiential interventions. They were blind to the hypotheses of this study.

Treatment

Exposure-Based Cognitive Therapy for depression (Grosse Holtforth et al., 2012; Hayes, Beevers, Feldman, Laurenceau, & Perlman, 2005) is a manualized treatment approach that was developed to foster cognitive-emotional processing in the treatment of depression. It integrates techniques from exposure-based treatment of trauma (Foa & Rothbaum, 2001) and emotion-focused therapy for depression (Greenberg & Watson, 2005). The three-phase structure of the approach is described elsewhere (Grosse Holtforth et al., 2012). For the purpose of this article it is important to note that all analyzed sessions stem from the middle phase of treatment during which patients approach disturbing material that involves negative views of the self and a sense of hopelessness and dread. The treatment manual does not prescribe any particular interpersonal techniques that make direct use of the therapeutic alliance as a catalyst of change.

Measures

Bern Post Session Report. The *Bern Post Session Report – Patient Form* (Flückiger, Regli, Zwahlen, Hostettler, & Caspar, 2010) was completed after every session to assess components of cognitive-emotional processing and the therapeutic alliance. To assess emotional arousal the *Problem Actuation* subscale (two items; sample item: “I was very emotionally involved in today’s session.”; Cronbach’s α = .73) was used. The *Clarification Experiences* subscale (three items; sample item: “I have the feeling that I got a better understanding of myself and my problems today.”; α = .80) was used to assess cognitive meaning making. The therapeutic alliance was

assessed by the *Bond* subscale (3 items; sample item: “The therapist and I understand each other.”; $\alpha = .83$) and the *Self-esteem Experiences* subscale (3 items; sample item: “I feel that the therapist values me as a person.”; $\alpha = .81$). The patients noted their responses using Likert scales ranging from -3 (*not at all*) to +3 (*yes, exactly right*). Flückiger et al. (Flückiger, Grosse Holtforth, Znoj, Caspar, & Wampold, 2012; Flückiger et al., 2010) demonstrated a stable factor structure (factor loadings: $.62 \leq \lambda \leq .95$) and good predictive validity. Intercorrelations of the subscales ranged in our sample from $r = .26$ (Problem Actuation and Bond) to $r = .80$ (Bond and Self-esteem Experiences).

Interpersonal joystick. A computer joystick apparatus that was developed and shown to have very strong convergent and discriminant validity by Sadler and colleagues (2009) was used to assess interpersonal behaviors of the participants on a moment-to-moment basis throughout the course of entire video-recorded therapy sessions. The software and manual can be downloaded for detailed information (Sadler, 2012). Observers rated patients’ and therapists’ dominant and affiliative behaviors during the video-recorded sessions with the help of a joystick that registered every 0.5 second the position of the joystick on a Cartesian plane ranging from -1,000 to 1,000 on both (x = affiliation; y = dominance) axes. For those passages where the rated person did not show any relevant interpersonal behavior – following Sadler and colleagues (2009) – raters were instructed to leave the joystick in a constant position. An average session produced a time series data set with 7,749 data points (average session length = 64 min 36 s). Four student raters that were blind to the hypotheses of the study and had no previous experience in rating interpersonal behavior were recruited. Two were female, and their mean age was 23.62 years. The same training procedure as described by Sadler et al. (2009) was

used and extended in order to adapt the instrument to the psychotherapy context: In addition to interpersonal adjectives, raters sorted items of the Checklist of Psychotherapy Transactions (CLOPT; Kiesler, 2004) into eight categories representing the octant scales of the interpersonal circle. After every training session, during which raters used the joystick method on recorded therapy sessions from the same clinic, interrater reliability was calculated and disagreements in the ratings were discussed until eliminated. The training period lasted four weeks and consisted of about 60 hrs. of intensive training. To increase the validity of the measure, we followed the method used by Markey, Lowmaster, and Eichler (2010): All four judges rated all 20 sessions from both perspectives in randomized order and then the mean values of all raters were used for subsequent analyses. Following the recommendations of Wirtz and Caspar (Wirtz & Caspar, 2002), we calculated intraclass correlation coefficients ($ICC_{2/2}$) based on all 20 sessions. The resulting ICCs for the variable dominance was $ICC_{2/2}$ = .73 and for the variable affiliation $ICC_{2/2}$ = .32. According to conventions regarding moment-to-moment ratings, these values can be considered as satisfactory for the dominance axis but only as moderate for the affiliation axis. As a consequence, the results regarding the affiliation axis, should be interpreted conservatively and are in strong need of replication.

To calculate a moment-to-moment index of complementarity for each point of the time series, we used the established method proposed by Kiesler (2004) following the two formulas: $Reciprocity = |(Patient\ dominance + Therapist\ dominance)|$; $Correspondence = |(Patient\ affiliation - Therapist\ affiliation)|$. The resulting absolute values have a range of 0-2,000. The value “0” would indicate perfect complementarity, whereas increasing values reflect increasing deviation from

complementarity.

Session selection

From each therapy, we selected the session with the peak value on the *Clarification* subscale of the BPSR-P from the middle phase of treatment, as individually indicated by the therapist. The reason for this selection criterion was the fact that in the same data set this peak score significantly predicts treatment outcome (Grosse Holtforth et al., 2012) and thus variation in this variable could be expected. The selected sessions ranged from session 4 to session 17 (M=10.50, SD=3.49).

Data-analytic strategy

To test whether patient's and therapist's behaviors within dyads are associated with each other in a complementary manner (hypothesis 1), we first calculated Pearson correlations for both interactants' moment-to-moment scores of dominance and of affiliation for all 20 dyads and then calculated a mean correlation from these values.

In order to test whether in-session interpersonal processes predict post-session evaluations of the alliance and cognitive-emotional processing (hypotheses 2-6), we calculated session means of the moment-to-moment indices of patient and therapist dominance and affiliation as well as of correspondence and reciprocity. We then ran multilevel models because therapy sessions (level 1) were nested in therapists (level 2). The ICC's for the dependent variables were as follows: Bond ICC(1) = -0.50, F(11, 8) = 0.44, p=.895, Self-esteem experiences ICC(1) = 0.01, F(11, 8) = 1.03, p=.499, Arousal ICC(1) = 0.46, F(11, 8) = 2.42, p=.109, and Clarification ICC(1) = 0.13, F(11, 8) = 1.25, p=.385. Although these values do not attain significance due to the small sample, the multilevel structure was chosen to take the therapists as a potential source of variance into account. To test the

predictive power of interpersonal processes in the face of patient hostility we calculated the relevant indices (see Table 1) only from those points in the time series during which the variable patient affiliation had a negative value. This procedure reduced our sample size from 20 to 14 because in 6 sessions patient hostility did not occur. Directed hypotheses were tested with one-tailed error probabilities.

To test for the hypothesized patterns of complementarity over the course of a session irrespective of session duration (hypothesis 7), time was transformed into percent of session. Then, multilevel growth models were run for the linear, the quadratic as well as the cubic trends of reciprocity and correspondence (z-standardized and multiplied by -1 so that higher values indicate more complementarity) over the course of the therapy session because multiple measurement points (level 1; range: 6,016-10,824) were nested in single therapy sessions (level 2) that, again, were nested within therapists (level 3). The choice of an analytical method for data with a multilevel structure was justified, given that reciprocity varied significantly among the therapy sessions, ICC(1) = 0.29, F(19, 154,969) = 3,203, p<.001, as well as among therapists, ICC(1) = 0.20, F(11, 154,977) = 3,244, p<.001. Correspondence also varied among therapy sessions, ICC(1) = 0.45, F(19, 154,969) = 6,263, p<.001, as well as among therapists, ICC(1) = 0.37, F(11, 154,977) = 7,684, p<.001. The multilevel regression analyses used orthogonal polynomials using maximum likelihood estimation.

Results

General degree of complementarity (hypothesis 1)

Mean r for patient dominance with therapist dominance was r = -.71 (SD = .14; *range*: -.86 to -.45), p<.001; patient affiliation correlated with therapist affiliation at r = .23 (SD = .18; *range*: -.12 to .58), p<.001. In order to check whether the therapists

consistently mirrored the patient's behavior or the other way around, we also conducted cross-correlations for both variables with 10 negative and 10 positive time lags in all sessions and found that the correlations for both variables reached a maximum at time lag 0 and consistently decreased with increasing as well as decreasing lags.

Prediction of the therapeutic alliance (hypotheses 2-4)

As the multilevel models in Table 1 show, the patient's mean affiliation in a psychotherapy session (M = 209, SD = 72) strongly predicts the patient's perception of the therapeutic alliance after the session, β = .64, p = .005, one-tailed (*bond; M* = 2.18, SD = 0.48) and β = .66, p = .003, one-tailed (*self-esteem experiences*; M = 1.97, SD = 0.46). In contrast, mean therapist's affiliation (M = 322, SD = 85) was unrelated to the alliance as perceived by the patient.

Testing the hypothesis that when patient hostility is present, the deviation from correspondence should be related to the alliance, Table 1 shows that neither bond (β = .01, p = .485, one-tailed) nor self-esteem experiences (β = -.17, p = .276, one-tailed) were predicted by the level of correspondence. Furthermore, we hypothesized that the minimal degree of therapist affiliation in the face of patient hostility should impede the alliance. This association was consistently, but only marginally significant for the bond scale (β = .51, p = .062, one-tailed) as well as for the self-esteem experiences scale (β = .38, p = .099, one-tailed).

Prediction of cognitive-emotional processing (hypotheses 5-6)

We tested the hypothesis (5) that the occurrence of a relationship conflict as indicated by the therapist behavior deviating from complementarity predicts emotional arousal as experienced by the patient. We found that correspondence (M = 139, SD = 72), β = -.42, p = .046, one-tailed, as well as reciprocity (M = 183, SD = 86), β = -

.39, $p = .055$, one-tailed, significantly predicted arousal. Furthermore, we assumed that (6) deviation from correspondence in the face of patient hostility should prevent a hostility impasse and thus promote clarification. This prediction emerged as a statistically insignificant trend, $\beta = -.48$, $p = .073$, one-tailed (see Table 1).

Trend of complementarity over the course of a session (hypothesis 7)

For the variable *reciprocity* (oppositeness on the dominance axis) the results were as follows: The random intercept model with fixed slopes fit the data better than the null model (only with an intercept), -2LL: $c^2_{diff(1)} = 1{,}967$, $p<.001$, and contained an insignificant intercept, $t(154{,}966) = -0.10$, $p=.919$, but significant linear, $t(154{,}966) = -21.85$, $p<.001$, quadradic, $t(154{,}966) = 23.98$, $p<.001$, and cubic trends, $t(154{,}966) = 30.45$, $p<.001$. Then, a third model was constructed that allowed intercepts as well as slopes to vary among therapy sessions (random intercept and slope model). In this model the parameter estimates were as follows: Intercept, $t(154{,}966) = -0.19$, $p<.851$, linear, $t(154{,}966) = -1.47$, $p=.143$, quadratic, $t(154{,}966) = 1.55$, $p=.121$, and cubic trend, $t(154{,}966) = 1.87$, $p=.061$. The random intercept and slope model had a better model fit than the random intercept model, -2LL: $c^2_{diff(1)} = 9{,}715$, $p<.001$. For the random intercept and slope model we found that the quadratic model fit the data better than the linear model, -2LL: $c^2_{diff(1)} = 3{,}211.4$, $p<.001$, and that the cubic, in turn, excelled the quadratic model, -2LL: $c^2_{diff(1)} = 5{,}388.8$, $p<.001$. We concluded that the cubic random intercept and slope model described the trend of reciprocity over the course of a therapy session best.

For the variable *correspondence* (sameness on the affiliation axis) the results were as follows: The random intercept model fit the data better than the null model, -2LL: $c^2_{diff(1)} = 374$, $p<.001$ and contained an insignificant intercept, $t(154{,}966) = -0.65$, $p=.518$, as well as significant linear, $t(154{,}966) = -6.73$, $p<.001$, quadradic, $t(154{,}966)$

= 17.79, $p<.001$, and cubic trends, $t(154{,}966) = -3.51$, $p<.001$. The random intercepts and slopes model for correspondence yielded the following parameter estimates: intercept, $t(154{,}966) = -0.63$ $p=.526$, linear, $t(154{,}966) = -0.53$, $p=.596$, quadradic, $t(154{,}966) = 1.539$, $p=.124$, and cubic trend, $t(154{,}966) = -0.399$, $p=.690$. This model represented the data better than the model in which only intercepts were allowed to vary, -2LL: $c^2_{diff(1)} = 23{,}574.6$, $p<.001$. Among the random intercept and slope models, we found again that the quadratic model had a better fit than the linear model, -2LL: $c^2_{diff(1)} = 2{,}654.8$, $p<.001$, and the cubic, in turn, excelled the quadratic model -2LL: $c^2_{diff(1)} = 8.390.8$, $p<.001$. Thus, the trend of reciprocity over the course of a therapy session was best described by the cubic random intercept and slope model. For illustration of the two average cubic models of reciprocity and correspondence, see Figure 1.

Discussion

The present study allows for a preliminary and tentative insight on the patient's and therapist's interpersonal affiliative and dominant microprocesses as they relate to each other, as they predict the patient's post-session evaluations, and as they evolve over the course of entire therapy sessions of a particular form of cognitive behavioral therapy for depression. We found that patient warmth predicted the therapeutic alliance and that the degree to which the interaction deviated from complementarity predicted arousal. Multilevel growth modeling revealed a cubic trend of complementarity over the course of an average session. Before discussing these findings, we caution the reader that the correlational nature of this study precludes any causal conclusions, and our results regarding the role of interpersonal processes in psychotherapy sessions should be regarded as preliminary.

General degree of complementarity

Consistent with hypothesis (1), we found that in sessions taken from the middle phase of treatment patient's and the therapist's behaviors were related to each other in a complementary manner, i.e., dominant therapist behavior was associated with submissive patient behavior and vice versa (reciprocity), whereas friendly therapist behavior was associated with friendly patient behavior and hostility with hostility (correspondence). Generally, the results of our analyses support the applicability of the joystick technique as a potentially adequate method to assess moment-to-moment interpersonal processes in a therapeutic context. The obvious effect size differences with regard to correspondence and reciprocity could be due to various reasons. It is possible that the low correlation of $r = .23$ for correspondence could be explained by the low interrater reliability of affiliation scores. However, assuming the difference in effect size is not a mere reflection of measurement error, we could tentatively conclude that the patients' and therapists' momentary behaviors relate to each other to a higher degree on the dominance axis, whereas on the affiliation axis other factors such as the predefined roles of the interactants, personality traits, the therapist's treatment plan, or current therapeutic tasks seem to play a more important role. Further research will need to improve the reliability of observer-based ratings of interpersonal behavior and shed more light on the potential influence of third variables.

Prediction of the therapeutic alliance

Partly confirming hypothesis (2), we found that the patient's – but not the therapist's – in-session level of affiliation predicted the alliance. These results extend earlier findings (Kiesler & Watkins, 1989; Wong & Pos, 2012) suggesting that in early stages of therapy it is both the patient's disclosing (friendly-dominant) and therapist's friendly behavior, as well as the dyad's level of complementarity that predict the

alliance. Our data suggest that in the middle phase of treatment the patient's friendly behavior seems to be a better indicator of a good therapeutic alliance than the therapist's behavior. Moreover, therapist affiliation explains only 5% of variance in patient affiliation, which points to the potential importance of third variables that were not assessed in this study.

In the face of patient hostility, the mean level of correspondence did not predict the alliance. This is inconsistent with hypothesis (3). However, a marginally significant effect with a large effect size seemed to corroborate hypothesis (4), suggesting that during patient hostility the minimal degree of therapist affiliation predicts the alliance. This result suggests that, in these crucial moments of therapy, a little bit of bad goes a long way, i.e., the therapist can impair the alliance by being pulled over to the hostile side of the IPC only once.

Prediction of cognitive-emotional processing

Lending support to hypothesis (5), the degree to which an interpersonal conflict occurred in the session – in the form of a deviation from reciprocity and correspondence – predicted patient-reported emotional arousal. This result has particular explanatory value as to why a decrease in complementarity in the middle (conflict) phase of treatment should be beneficial. Whereas the vast majority of the studies in this area (for review see Tracey, 2002) try to link the trend of complementarity over the course of therapy to outcome, our data shed some light on the underlying psychological processes: A deviation from expected interpersonal dynamics may create a constructive conflict that potentially induces emotional arousal on the client side, which in turn predicts treatment success. Remarkably, the predictive power of correspondence and reciprocity was comparable. This suggests that a departure from complementarity might be beneficial irrespective of whether this

occurs on the affiliation or dominance axis. However, since friendly behavior was a lot more frequent than hostile behavior in our study, we should be very cautious with generalizing these results with regard to behaviors in the hostile hemisphere of the IPC.

Lending tentative support to hypothesis (6), a large but only marginally significant effect suggests that when patients behaved in a hostile manner, then a deviation from correspondence was predictive of a higher degree in clarification experiences. This result is particularly informative in light of the notion of hostility impasses (McCullough, 2000). In order to focus on the content of the discussion and thus to engage the patient in a process of meaning making it seems to be especially important for the therapist not to answer to the pull of patient hostility but to remain (unexpectedly) friendly.

Trend of complementarity over the course of a session

Our study was the first to investigate the trends of correspondence and reciprocity over the course of a psychotherapy session. Consistent with hypothesis (7), the results of the multilevel growth models of both variables reveal that, over all 20 sessions, a cubic function represents the data best. This supports our assumption that the trend of complementarity over the course of a session resembles that of a whole therapy as shown by Tracey and colleagues (1999). However, as displayed in Figure 1, a slight differentiation is necessary with regard to the two variables: Reciprocity initially increases at the beginning, then decreases in the middle, and rises again towards the end of the session. This finding suggests that an interactional attunement seems to be necessary to reach a harmonious peak in the session before a relationship conflict occurs. This assumed “warm-up phase” would be masked if only the quadratic trend was considered. In contrast, for correspondence the cubic

trend also has the best model fit but the cubic coefficient is so small that its influence on the growth curve is visually undetectable. Accordingly, the initial increase in correspondence is lacking. It starts decreasing from the beginning onwards and increases again towards the end. Although in need of replication, this could be interpreted as a very tentative indicator of the possibility that a phase of interactional attunement might be typical only of the trend over time in dominance but not in affiliation.

Limitations

First, the small sample size (12 therapists treated 20 patients) strongly calls for replications of the findings. Especially the fact that 1 therapist conducted 35 % of the rated sessions limits generalizability. Secondly, only one non-randomly selected session was coded from each therapy. Several randomly selected sessions or, even better, complete ratings of all sessions would make a stronger claim. Moreover, instead of selecting sessions with peak values in a process measure, one could obtain more power to detect subtle associations if very successful and very unsuccessful sessions are contrasted. Thirdly, only a weak interrater reliability for affiliation could be achieved in this study. Therefore, results regarding the affiliation axis should be interpreted conservatively and are in strong need of replication. Future studies could try to maximize rater agreement by chopping the sessions into shorter slices to be rated and by rating the affiliation and dominance axis and/or verbal vs. nonverbal behaviors independently. Fourthly, personality disorders were not routinely assessed at the clinic and therefore could not be ruled out as a potential third variable that influences interpersonal processes in therapy. Fifthly, the natural variation of the supposedly relevant variables was observed. This design precludes causal interpretations. Ideally, the process variables should be manipulated

experimentally. However, such a design is difficult to implement and will mostly be limited to the non-clinical context. Consequently, the most convincing empirical support in this kind of psychotherapy process-outcome research would come from multiple studies adhering to systematic methodological pluralism (Elliott, 2010). Finally, the generalizability of the present findings is limited to depressed patients and to a particular form of Cognitive-Behavioral Therapy. For future studies, it will be vital to check if results generalize to other psychopathologies and/or treatment approaches.

Therapeutic implications

To sum up, the therapeutic implications of our study are the following: Depending on the therapist's current process goal, he or she should adhere to differential interpersonal strategies in the working phase of treatment. To foster the alliance, therapists should try to engage the patient in a consensual and friendly interchange and should refrain from answering to the pull of patient hostility. In contrast, to promote cognitive-emotional processing, therapists should seek to introduce a constructive relational conflict by deviating from complementarity and thus disconfirming the patient's interpersonal expectations. Therapists should expect this relational conflict to occur typically towards the middle of the session.

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Tables and Figures

Table 1

Multilevel models predicting post-session evaluations from in-session interpersonal processes

	Therapeutic alliance								Cognitive-Emotional Processing							
	Bond				Self-esteem experiences				Arousal				Clarification			
n = 20	*β*	*SE*	*t*(7)	*p*	*β*	*SE*	*t*(7)	*p*	*β*	*SE*	*t*(7)	*p*	*β*	*SE*	*t*(7)	*p*
Patient affiliation	0.64	0.18	3.55	**.005**	0.66	0.17	3.85	**.003**	-0.08	0.23	-0.33	.750	0.17	0.21	0.78	.460
Patient dominance	-0.05	0.24	-0.23	.828	0.01	0.23	0.04	.968	-0.04	0.21	-0.20	.848	-0.17	0.20	-0.86	.416
Therapist affiliation	0.03	0.24	0.13	.450	0.31	0.22	1.41	.105	0.38	0.25	1.51	.174	0.34	0.23	1.50	.177
Therapist dominance	-0.05	0.24	-0.20	.844	-0.22	0.23	-0.98	.361	-0.41	0.21	-1.91	.098	0.26	0.22	1.18	.277
Correspon-dence	0.29	0.23	1.28	.240	0.16	0.24	0.68	.520	-0.42	0.21	-1.95	**.046**	-0.10	0.23	-0.42	.689
Reci-procity	0.02	0.24	0.11	.919	-0.07	0.23	-0.30	.771	-0.39	0.22	-1.83	**.048**	0.01	0.22	0.02	.986
n = 14	*β*	*SE*	*t*(7)	*p*	*β*	*SE*	*t*(7)	*p*	*β*	*SE*	*t*(7)	*p*	*β*	*SE*	*t*(7)	*p*
during pat. host. *Mean* th. aff.	0.02	0.31	0.08	.942	0.17	0.27	0.62	.561	0.35	0.24	1.44	.209	0.31	0.28	1.10	.321
during pat. host. *Min.* th. aff.	0.51	0.28	1.84	.062	0.38	0.26	1.48	.099	0.23	0.22	1.08	.335	0.02	0.25	0.07	.946
during pat. host. Corr.	0.01	0.31	0.04	.485	-0.17	0.27	-0.61	.286	-0.31	0.27	-1.18	.291	-0.48	0.28	-1.72	.073

Note. Expected predictions according to assumptions are in grey shading; only hypotheses were tested for one-tailed error probability, all other predictions were tested two-tailed. Significant predictions are bold-faced. During pat. host. = patient hostility; Mean th. aff. = Mean therapist affiliation; Min. th. aff. = Minimal therapist affiliation; Corr. = Correspondence

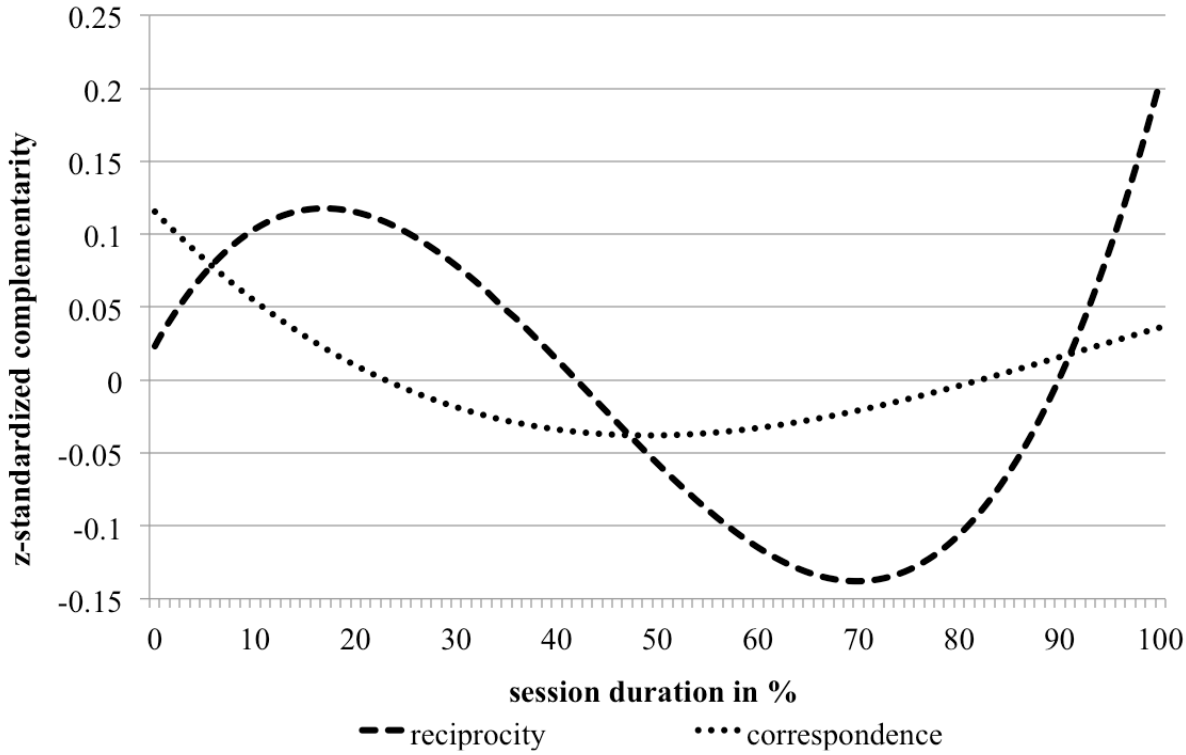

Figure 1. Progression of reciprocity and correspondence over the course of a session.

Session length (x-axis) is standardized to percent because the same trend is expected irrespective of the individual session length. The original variables of deviation from reciprocity and correspondence were (a) z-standardized in order to integrate them into one graph and (b) multiplied by -1 so that higher scores indicate more complementarity.

3. General Discussion

The closing section of this dissertation is structured as follows: At first, the general aims of the dissertation project are briefly revised. Then, the specific results are explained theoretically and their contributions to the field of psychopathology and psychotherapy research are discussed. In order to integrate the results of the empirical studies their results are discussed jointly when appropriate. In a next step, the strengths and limitations of this dissertation project are critically considered with particular focus on generalizability of the results. Based on these reflexions, directions for potential future research projects are pointed out.

3.1 Discussion of the Results

As pointed out in the introductory section of this dissertation, depression is a widespread (Kessler & Wang, 2009), debilitating (Kessler, 2012), and undertreated (Kessler et al., 2003) psychopathology. Although there exist effective psychotherapeutic treatments for depression (Cuijpers et al., 2011; Cuijpers, van Straten, Andersson, & van Oppen, 2008), their long-term effects are insufficient (Vittengl, Clark, Dunn, & Jarrett, 2007) and their mechanisms of change are unsatisfactorily understood (Castonguay & Beutler, 2006). One way to improve psychotherapy for depression is to deepen our understanding of the interpersonal facets of depression and test how a change in interpersonal style is related to treatment success. Another way to enhance therapeutic effects, is to increase our knowledge about the actual interpersonal micro-processes that unfold between therapist and patient and foster known active ingredients of psychotherapy. The following section specifies how the three empirical studies included in this

dissertation pursued these two goals, briefly recapitulates the results of the studies and discusses them with regard to their contribution to the field of depression research and psychotherapy research.

3.1.1 Interpersonal characterization of patients with depression. The first aim of this dissertation project was to characterize patients with depression based on their interpersonal style. In a first step, study 1 pursued this goal by assessing impact messages that patients with depression evoked in their significant others, using the Impact Message Inventory and considering both octant and dimensional scores of the instrument. The study found that depressed patients were perceived as more submissive, hostile-submissive, and friendly-submissive as well as less dominant and friendly dominant by their significant others than all other psychotherapy patients by their respective significant others. Considering dimensional scores, patients with depression scored lower on the control (also: assertiveness, dominance) axis of the IMI than all other psychotherapy patients, whereas there was no difference on the affiliation axis. These results corroborate the previously found submissive interpersonal style of patients with depression. But, whereas previous studies relied on IIP self-report ratings (Barrett & Barber, 2007; Cain et al., 2012; Grosse Holtforth et al., 2014; Vittengl, Clark, & Jarrett, 2003) or IMI ratings by therapists (Constantino et al., 2008), study 1 was the first to use IMI ratings from the perspective of the patients' significant others. This is a substantial contribution to the ecological validity of the portrayal of depression. However, it leaves the question unanswered how different perspectives on patient interpersonal style are related to each other. This target was aimed at in study 2 by assessing patient interpersonal impact messages from the perspective of significant others, using again the IMI, as well as by assessing self-reported interpersonal problems from the perspective of the patients

themselves, using the Inventory of Interpersonal Problems. In this second study, only dimensional scores were taken into account. The study found that the respective dominance axes of IIP and IMI were positively associated, but the affiliation axes were unrelated. Without disregarding the fact that IIP and IMI assess different constructs, this result raises interesting methodological questions if compared with earlier findings: A recent study (Quilty, Mainland, McBride, & Bagby, 2013) related patients' IIP ratings with IMI ratings by their therapists and found no association on the affiliation axis, just as study 2. However, in contrast to our study's moderate agreement on the control dimension the study by Quilty and colleagues found a strong negative correlation on this axis, i.e., the more the patients perceived themselves as dominant the more submissive they were perceived by their therapists and vice versa. This intriguing contrast of results invites to speculate about the validity of the therapist as a source of information on patient interpersonal style. First, therapists – in stark contrast to the significant others – construct their views based on a limited number of interactions in well-defined situations with pre-ascribed roles, limiting the range of potential patient behaviors and thus biasing the therapists' impressions. Second, assessing interpersonal style from the perspective of the patients' therapists is particularly questionable if an interpersonal treatment protocol promoting very specific interpersonal changes are used. This was the case in the study by Quilty and colleagues and also in an earlier study (Constantino et al., 2008). Therefore, it is likely that the therapists' perception of their patients' interpersonal style (and its change) was influenced by their presumptions, whereas studies 1 and 2 used ratings of the significant others who were completely blind to the study's hypotheses. Nevertheless it remains an open question whether therapists or significant others provide the most valid information on patient interpersonal style.

This could best be tested in an unprecedented study directly relating these two perspectives.

Another aim of this dissertation project with respect to the interpersonal characterization of patients with depression was to investigate whether sub-groups of patients can be distinguished based on their distinct interpersonal features. Study 1 was the first to investigate this, and cluster analysis revealed four empirically distinct groups. The two largest groups were in the friendly-submissive and hostile-submissive range of the IPC, confirming the average submissiveness of patients with depression. However, the small but substantial groups of individuals with depression that were perceived by their significant others as hostile-dominant or friendly-dominant make it seem particularly important for psychotherapists to define a specific interpersonal theme for each patient and include it in case conceptualization and treatment planning instead of assuming that all patients with depression have the same interpersonal style that they need to change in the same manner. The heterogeneity of patients based on IMI ratings was corroborated by a subsequent study that was based on IIP self-reports and also found interpersonally distinct groups (Grosse Holtforth et al., 2014). Considering this variability in interpersonal style, readers are cautioned to assume that the results regarding associations with outcome interpreted in the following sections are accurate for all patients with depression. Instead, readers are urged to bear in mind that for a substantial minority of these patients, perhaps, another change in interpersonal style would be more beneficial. This differentiation is in line with integrative interpersonal treatment approaches that view the idiosyncratic interpersonal style of a patient as a rigid coping strategy to deal with life stress that needs to become more flexible during treatment (Anchin & Kiesler, 1982; Teyber & McClure, 2010).

3.1.2 Change of interpersonal style over therapy. Besides typifying psychotherapy patients with depression based on their interpersonal features when they entered psychotherapeutic treatment, this dissertation project attempted to investigate in what way the same patients changed during psychotherapeutic treatment. Study 1 investigated this question, as described in the previous section, by assessing impact messages from the perspective of the patients' significant others and found that hostile, hostile-submissive, submissive, and friendly-submissive IMI octants decreased during therapy, whereas dominant and friendly-dominant IMI octants as well as both axes of control and affiliation increased significantly. However, study 2 of this dissertation, that also investigated the change in IMI dimensions (but not octants) found a pronounced increase in the IMI control axis, whereas the affiliation axis remained constant. These results contrast the findings of two other studies that also reported change in impact messages over treatment: Constantino and colleagues (2008) found that patients decreased in submissive, hostile, and hostile-dominant octants, whereas they increased in the friendly-submissive and friendly-dominant scales. Quilty and colleagues (2013) reported the IMI affiliation axis to increase and no change on the control axis. To sum up, all four studies reporting IMI change during psychotherapy produced heterogeneous results. As mentioned in the previous section, the two earlier studies (Constantino et al., 2008; Quilty et al., 2013) used IMI ratings by therapists, which is questionable because therapists were not blind to the study's hypotheses, particularly regarding interpersonal change. Moreover, the study by Constantino and colleagues was conducted exclusively with patients who suffered from chronic depression, whereas study 1 used a sample of patients with all courses of depression (including dysthymia) and study 2 only used patients with first or recurrent episodes of

depression. Based on Conye's (1976) interpersonal description of depression it can be assumed that patients who suffer from depression longer, such as in chronic depression, show more hostility and are more likely to change in these characteristic interpersonal areas if the treatment approach addresses it explicitly, as is the case with CBASP. Nevertheless, these possible explanations leave the inconsistent findings of study 1 (increase of IMI control and affiliation dimensions) and study 2 (only increase of IMI control) unresolved. One possible explanation could lie in the design of the studies: While study 1 was conducted in a naturalistic setting in a university-based outpatient clinic where patients with depression were very heterogeneous and therapists were more flexible in treatment planning regarding the application of concrete interventions and treatment length, study 2 was conducted in the context of a randomized-controlled trial and therapists adhered to one of two treatment manuals that did not focus on interpersonal change, and treatment ended in all cases after 22 sessions. This could have been insufficient for changes on the affiliation axis to occur. This could cautiously be interpreted by assuming that particular changes in interpersonal style are more likely to occur if therapists can react freely to patient interpersonal style and if therapeutic strategies are not restricted by too narrow guidelines of a treatment protocol.

Study 2 extended the view on change in interpersonal style by also incorporating the patient perspective on interpersonal problems: IIP distress decreased significantly over the course of psychotherapy, but IIP affiliation increased significantly and IIP dominance increased with marginal significance. This contrasted earlier null findings regarding the change in single IIP dimensions (Quilty et al., 2013; Renner et al., 2012; Vittengl et al., 2003) which could be due to the fact that the treatment in all previous studies were considerably shorter than in our study. Study 2

was also the first one to investigate the relationship between pre-post IIP dimensional change and pre-post IMI dimensional change and found, as assumed, no significant correlations of the respective dimensions. Taken together, the contrasting results regarding IMI and IIP change are suggestive of the interpretation that self-reported interpersonal problems and other-reported impact messages are by no means redundant but provide valuable complementary information. Practitioners as well as researchers are well advised to bear in mind that patients with depression seem to most readily perceive an increase in their own (IIP) friendliness whereas for their significant others an increase of (IMI) dominance seems to be more salient. However, these results still leave the question unanswered whose perspective on patient interpersonal style is more valuable. This subject of differential predictive validity is approached in the next two sections.

3.1.3 Relation of change in interpersonal style to treatment success. In an attempt to investigate the role of interpersonal change as a potential general mechanism of change in psychotherapy for depression the current dissertation sought to relate change in interpersonal style to symptomatic improvement during and after treatment. First, study 1 analyzed the relationship between pre-post change in IMI octants and dimensions as reported by the patients' significant others and pre-post change in self-reported symptomatology and general approach goal satisfaction. The most consistent finding was that decrease in hostile-submissive and submissive octants correlated with improvement in symptomatology across different measures. This result was validated by a simultaneously published study that also found a clear relation of a decrease in hostile-submissive impact messages to outcome (Constantino et al., 2012). When changes in IMI dimensions of control and affiliation were considered, then associations differed depending on the outcome measure (see

Table 3 of study 1). However, these results have to be treated with caution for several reasons: First, the fact that numerous significant others did not provide data at two time points, led to a considerable decrease in the numbers of patients available for these analyses. Second, the explanatory value with regard to causality is limited because potential confounders were not taken into account in this purely correlational design and change in interpersonal and outcome variables were assessed simultaneously and not subsequently. These methodological shortcomings call for a reiteration of these analyses based on a larger sample and with more elaborate statistical methods.

Study 2 attempted to address these issues in the following way: On the one hand, in the context of the rigorously conducted RCT, copious resources were dedicated to ensure maximum data return which resulted in an increase in sample size for the aforementioned analyses by the factor 2.5 in comparison with study 1. On the other hand, instead of calculating mere correlations between variables, study 2 calculated multilevel regression models, taking into account the therapist as a potential source of variance, i.e., statistically controlling for the possibility that particular therapists consistently achieve better results in therapy. Furthermore, study 2 extended the previous study's evaluation, as explained in previous sections, by integrating the perspectives of the patients themselves as well as that of their significant others on the patients' interpersonal style. Also, study 2 was the first to not only relate interpersonal change to simultaneous symptomatic change but to use pre-post change in interpersonal variables to predict subsequent change in symptomatology from post to three months after treatment. This timeline of assumed cause and effect enhances the meaningfulness regarding causal inferences (Kazdin, 2007). The results of the study demonstrated that a pre-post decrease in IIP distress

was most closely tied to a simultaneous pre-post reduction in depressive and general symptomatology, whereas symptomatic improvement subsequent to treatment termination was best predicted by a pre-post increase in IMI dominance. The fact that IIP distress was most closely associated with simultaneous symptomatic change if all predictor variables were tested concurrently is not surprising, as previous studies converged on the notion that overall IIP distress is not genuinely interpersonal. It does not indicate a particular interpersonal theme, but merely represents a general factor representative of the level of suffering or impaired functioning, similar to generic symptomatology (Grosse Holtforth, Lutz, & Grawe, 2006; Gurtman, 2004). However, if the five interpersonal predictor variables were tested separately, then the pre-post change in IMI dominance was a significant predictor in two out of three outcome measures (see Table 5 of study 2). This is suggestive of the importance of the interpersonal change through the eyes of significant others. This result is corroborated and extended by the fact that the pre-post change in the IMI dominance dimension outperforms all other interpersonal variables in predicting symptomatology subsequent to therapy termination. This result suggests that, in order to sustainably alleviate psychological suffering, it is essential for patients to become more assertive and self-confident, whereas it might be irrelevant whether they become more agreeable, sociable or friendly. Moreover, it seems to be insufficient that the patients themselves perceive a change in their interpersonal problems but it seems to be decisive that these changes are perceived and reacted to in social interactions by the patients' significant others. Thus, our results, although in need of replication, suggest that change in interpersonal style is only beneficial to the degree that the patient manages to translate his new, more functional relational behaviors into his daily social life.

To sum up, the results of study 1 and 2 regarding the association between interpersonal change and symptomatic improvement contribute considerably to the field of psychotherapy research by empirically underpinning the importance of the perspective of significant others. The results suggest that practitioners, when faced with questions such as what particular interpersonal strategies to follow, or when to terminate treatment, should not to exclusively rely on their patients' reports but should take the perspective of partners, friends, relatives, colleagues etc. into account because these persons constitute their actual social environment. Their positive or negative reactions to the patients' interactional patterns, as explained at length in the introduction of this dissertation, are one of the crucial factors that determine whether the depression is maintained or improved.

3.1.4 Prediction of psychotherapy process by interpersonal pre-treatment characteristics. A promising strategy to enhance psychotherapy for depression is to investigate which interpersonal factors foster the known active ingredients of treatment. Study 2 of this dissertation pursued this goal by predicting the early therapeutic alliance and cognitive-emotional processing averaged over the whole therapy by pre-treatment interpersonal characteristics of patients with depression using multilevel modelling. The analyses took into account both self-reported interpersonal problems (IIP dominance and affiliation dimensions, as well as distress) and other-reported impact messages (IMI dominance and affiliation dimensions). The study found that pre-treatment IIP affiliation emerged as the best predictor of both the early therapeutic alliance and cognitive-emotional processing. None of the other interpersonal variables predicted either of the process variables. These results extend the findings of earlier studies focusing mainly on the alliance (Connolly Gibbons et al., 2003; Dinger, Strack, Sachsse, & Schauenburg, 2009) and

suggest that it does not only promote the early therapeutic relationship if a depressed patient sees him- or herself as warm and agreeable when entering a psychotherapy, but that this self-representation also relates to his or her levels of emotional arousal and emotional insight across the course of therapy. This is in line with the view of several theorists that patient unfriendliness leads to hostility impasses and impedes a constructive therapeutic process (Kiesler, 1996; Safran & Muran, 2003). Viewed through the theoretical lens of the IPC the results of study 2 are particularly allegeable because hostility is synonymous to coldness, antagonism, and detachment and therefore, by definition, should impede a constructive therapeutic process. However, it can be argued that it is an empirical truism that patients who view themselves as too friendly also give a polite and agreeable feedback concerning the therapeutic process. As discussed below, study 3 tries to solve this methodological problem by assessing the in-session interpersonal patient behaviour from a less subjective perspective of trained raters. The result that friendly impact messages as perceived by the patients' significant others do not predict the therapeutic process, is inconsistent with Constantino and colleagues' (2010) study. Yet, in this earlier study, impact messages were assessed from the viewpoint of the therapist. This suggests that a therapist's and a significant other's report on impact messages received from the same person (the client) fundamentally differ, and that the significant others' reports are not as indicative of what happens during the sessions as is the therapist's perspective. However, Constantino and colleagues' findings may also seem self-evident considering the possibility that when a problem with the therapeutic alliance arises, the therapist's view might be biased in that he attributes relational complications to the patient's antagonism.

Taken together, the results regarding the prediction of therapeutic process by pre-treatment interpersonal qualities, although preliminary, implicate that for questions of treatment allocation and planning of the therapeutic process, self-reported affiliation seems to be particularly informative.

3.1.5 Beneficial interpersonal micro-processes in psychotherapy for depression. Study 3 pursued the goals to gain insight on the patient's and therapist's interpersonal affiliative and dominant micro-processes as they relate to each other, as they predict the patient's post-session process evaluations, and as they evolve over the course of entire therapy sessions of CBT. To do so, sessions with high levels of clarification were selected from the working phase of 20-session Exposure-Based Cognitive Therapy for Depression. To assess interpersonal micro-processes a novel joystick technique was used that produced fine-grained real-time data on patient and therapist behaviours and after each session patient reports on the therapeutic alliance and cognitive-emotional processing were collected. Confirming previous assumptions, the study found that patient's and the therapist's behaviors were related to each other in a complementary manner, lending support to the applicability of the joystick technique as a potentially adequate method to assess moment-to-moment interpersonal processes in a therapeutic context. Furthermore, multilevel modeling revealed that the patient's – but not the therapist's – in-session level of affiliation predicted the alliance. These results extend earlier findings (Kiesler & Watkins, 1989; Wong & Pos, 2012) suggesting that, in contrast to the beginning phase of therapy, in the middle phase of treatment the patient's friendly behavior seems to be a better indicator of a good therapeutic alliance than the therapist's behavior. Moreover, this result corroborates the findings of study 2 suggesting that it

is not only the patient's – potentially biased – perception of his or her warmth but the actual affiliative behavior of the patient that predicts the quality of the alliance.

With regard to the prediction of cognitive-emotional processing, the data demonstrated that the degree to which an interpersonal conflict occurred in the session – in the form of a deviation from reciprocity and correspondence – predicted patient-reported emotional arousal. This result lends preliminary empirical support to the hypothesis that nonconformity with expected interpersonal dynamics may create a constructive conflict that potentially induces emotional arousal on the client side, which, in turn, predicts treatment success. The finding that the predictive power of correspondence and reciprocity was comparable can be interpreted by assuming that a departure from complementarity might be beneficial irrespective of whether this occurs on the affiliation or dominance axis. However, as explained below, the results regarding the affiliation axis have to be interpreted conservatively because interrater reliability for affiliative behaviors was moderate.

Our study was the first to investigate the trends of correspondence and reciprocity over the course of a psychotherapy session. Multilevel growth modelling of both variables revealed that a cubic function represents the data best. This supports the previously formulated assumption that the trend of complementarity over the course of a session typically resembles that of an entire therapy as shown by Tracey and colleagues (1999).

To sum up, the results of study 3 provide a first and tentative insight on the patient's and therapist's interpersonal affiliative and dominant microprocesses as they relate to each other, as they predict the patient's post-session evaluations, and as they evolve over the course of entire therapy sessions of a particular form of cognitive behavioural therapy for depression. Although preliminary, the results are

suggestive of the following treatment implications: Depending on the current process goal, the therapist should pursue distinct relational strategies: To foster the alliance, therapists should attempt to engage the patient in a consensual and friendly interchange and should avoid answering to the pull of patient hostility. In contrast, to promote cognitive-emotional processing, therapists should aim at eliciting a productive interpersonal conflict by deviating from complementarity and thus challenging the patient's interpersonal expectations. Therapists can anticipate this conflict to occur typically in the middle of the session.

3.2 Limitations and recommendations for future research

As discussed in the previous sections, this dissertation contributes to a refined understanding of the relational facets of depression. However, the presented empirical studies have several shortcomings that deserve to be considered below. Based on these shortcomings, the following section includes suggestions for possible future research.

First, it is important to note that the generalizability of all three findings is limited. All three studies were conducted with relatively homogeneous samples of patients with depression. Transdiagnostic theories suggest considerable commonalities between emotional disorders such as depression, social anxiety disorder, generalized anxiety disorder, obsessive-compulsive disorder, and panic disorder with agoraphobia regarding shared etiological pathways, higher-order symptomatic presentation, and adequate treatment strategies (for review, see Barlow, Bullis, Comer, & Ametaj, 2013). Nevertheless, it will be vital for future research to check if the findings regarding interpersonal characterization, interpersonal process and beneficial change hold true or differ across different

diagnoses. Furthermore, the studies were conducted in a European cultural context and patients and therapists were almost exclusively adults of Caucasian ethnicity. In consequence it is desirable that the findings are replicated in other cultural environments and with more diverse subjects regarding age and ethnic background. It is important to note that the psychotherapeutic treatments used in the three studies did not forbid therapists to explicitly address the subject of interpersonal functioning in the sessions but did also not particularly focus on this aspect. Therefore, it would be informative to replicate the findings with treatment approaches that are predominantly interpersonal in nature, such as Interpersonal Therapy (Klerman & Weissman, 1994), or the integrative interpersonal treatment approach by Teyber and McClure (2010).

Another problematic issue refers to the sample sizes of the studies: Studies 1 and 2 were conducted with 180 and 143 patients respectively, which can be considered relatively large samples compared to other psychotherapy studies (Cuijpers et al., 2008). Nevertheless, it is possible that these sample sizes mask the influence of potential moderators, and prevent analyses on the sub-group level, although the finding that distinct interpersonal sub-groups of patients with depression seems to hold true across different instruments and perspectives (Study 1 of this dissertation; Grosse Holtforth et al., 2014). In consequence it would be fruitful to test what kind of interpersonal change is most productive for patients with a particular interpersonal style. Whereas in studies 1 and 2 the sample sizes are considerable, the process analyses in study 3, however, are based on only one session from 20 therapies. Therefore, the preliminary results of this study have to be interpreted with caution and call for replications with greater samples.

Another methodological problem of this dissertation project is the fact that causal interpretations are subject to restrictions for several reasons: In all three studies the supposedly relevant variables were observed based on their natural variation. This design is vulnerable to the influence of confounding variables. Ideally, the interpersonal variables should be manipulated experimentally. For ethical reasons, such a design would most likely be restricted to non-clinical contexts but could contribute to confirming the stability of the effects presented in this dissertation. In the context of psychotherapy studies that are conducted with clinically afflicted individuals, the most convincing empirical support would come from multiple studies adhering to systematic methodological pluralism (Elliott, 2010). Moreover, the causal explanatory value is increased if a clear timeline between cause and effect is established (Kazdin, 2007). Study 2 attempts to compensate for the obvious shortcoming of study 1 in that respect by relating pre-post interpersonal change to symptomatic change subsequent to treatment termination. An even more convincing design, however, would be the assessment of control and affiliation as well as symptomatology with time-efficient assessment methods at multiple time points during and/or after psychotherapy.

In study 3, the obvious problem of weak interrater reliabilities regarding the affiliation axis adds to the preliminary and fragile character of the presented findings and call for a replication and an improved rater training. Accordant suggestions are made in the discussion section of study 3 and are not recapitulated here to avoid redundancy.

Another limitation of the dissertation project is the fact that, on the one hand, it points out the importance of interpersonal change in psychotherapy as a potential mechanism of change, but, on the other hand, it leaves the question unanswered

what causes or promotes interpersonal change. This issue could be investigated in future studies by testing whether a constructive relational conflict in the middle of the therapy, as assessed by an observer-based method such as the joystick technique, is related to self- or other-reported interpersonal change. Even more informative with regard to clinical implications would be a study that tests what concrete therapeutic interventions, e.g. social skills training, role play, interpretation of transference etc., actually promote a change in patient interpersonal behavior.

Finally, the exact method of assessment of interpersonal variables deserves reconsideration by future studies: Study 2 concurrently tests the predictive validity of self- and other-reported interpersonal style. However, it does so by taking self-reported IIP ratings and other-reported IMI ratings from the perspective of significant others into account. Although IIP and IMI have been shown to both adhere to circumplex characteristics, they are based on slightly different constructs. This impedes the direct calculation of difference scores between the two perspectives to assess for the congruence of self- and other-representation. Therefore, future studies should consider assessing patient interpersonal style by the same assessment method, such as the IIP, from numerous perspectives (patients, significant others, therapists) in the same study at multiple points throughout treatment. For this, it would be profitable to develop time-efficient questionnaires that use only one or two items for every octant of the interpersonal circumplex.

It is my personal hope that future studies will build on the findings of this dissertation project in order to improve the well-being of psychotherapy patients and, more generally, of individuals who struggle with relational problems in their daily life. I whish that other scientists may find their work in the fascinating field of interpersonal psychology as rewarding, stimulating, and insightful as I did.

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CURRICULUM VITAE OF DAVID ALTENSTEIN

Date of birth: 31. Dezember 1980
Place of birth: Cologne, Germany
Nationality: D

EDUCATION / DEGREES

2009 - present	Ph.D. student, University of Zurich, Switzerland (Prof. Dr. Martin Grosse Holtforth)
2009 - present	Postgraduate psychotherapy training, Klaus Grawe Institute for Cognitive Behavioral & Interpersonal Therapy, Zurich, Switzerland
2009 - 2010	Postgraduate psychotherapy training, Freiburg Institute for Behavior Therapy (FAVT), University of Freiburg, Germany
2007 - 2008	Master‘s thesis & research internship at the University of Bern, Switzerland (supervisor: Prof. Dr. Martin Grosse Holtforth)
2006	Research internship at the University of Geneva (Prof. Dr. Franz Caspar)
2005 - 2008	Master's-level training in psychology (Dipl.-Psych / MA), University of Freiburg, Germany
2004 - 2005	Exchange year, University of Toulouse 2, Le Mirail, France
2002 - 2004	Basic training in psychology (Grundstudium), University of Potsdam, Germany
2001 - 2002	Basic training in Law, University of Passau, Germany

THERAPEUTIC EXPERIENCE

2013 - present	Psychiatric Clinic Sanatorium Kilchberg, Switzerland
2012 - present	Outpatient clinic of the Klaus Grawe Institute for Cognitive Behavioral & Interpersonal Therapy, Zurich, Switzerland
2009 - 2013	Outpatient clinic of the University of Zurich
2009	Psychiatric Clinic of the Freiburg University Medical Center

ACADEMIC AND PROFESSIONAL AFFILIATIONS

Society for Psychotherapy Research (SPR)

SCIENTIFIC CONTRIBUTIONS

1. ARTICLES

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2. PRESENTATIONS & POSTERS (Selection)

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Altenstein, D., Grosse Holtforth, M., Sutter, M., & Schmied, E. (2008). Integrating empirically based principles of change – Feasibility and effectiveness of the Exposure-based Integrative Psychotherapy for Depression (EIPD). Paper presented at the 39th annual Conference of the Society for Psychotherapy Research, Barcelona, Spain.

3. MASTER'S THESIS

Altenstein, D. (2008). Vorstudien zur Evaluation der Expositionsbasierten Allgemeinen Psychotherapie bei Depressionen. Master's Thesis. Universität Freiburg, Institut für Psychologie. Freiburg.